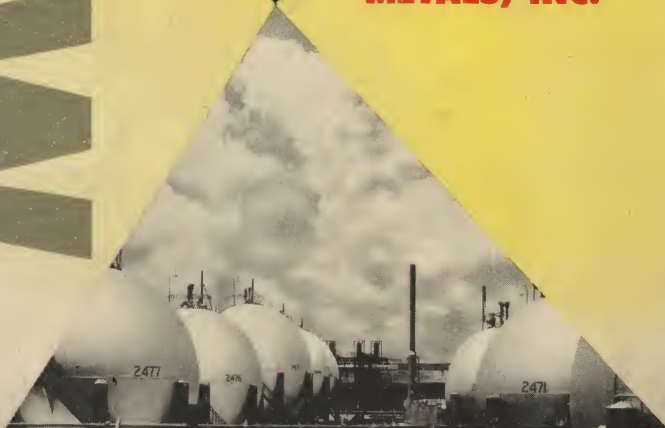
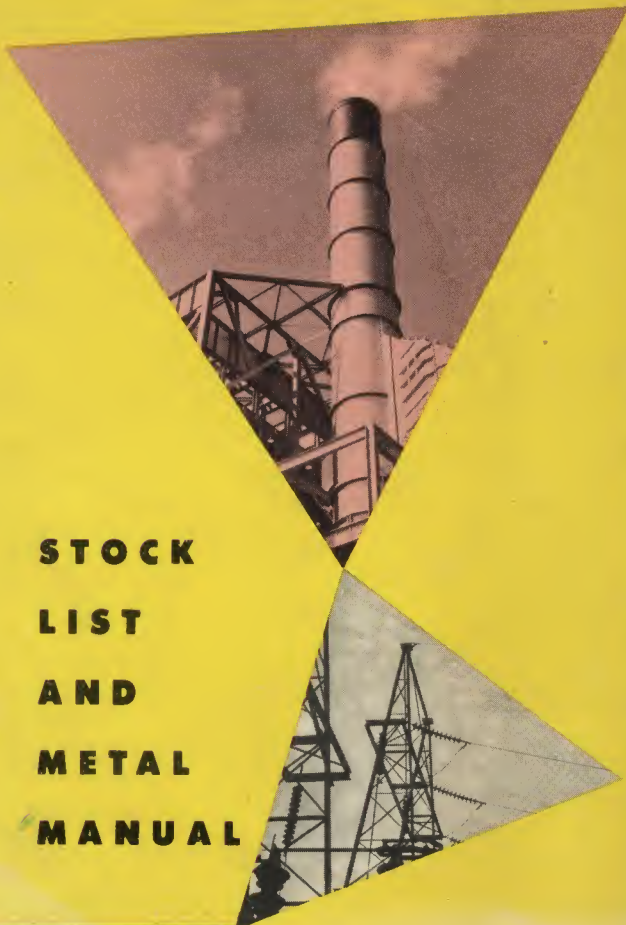


# METALLOG

**STOCK  
LIST  
AND  
METAL  
MANUAL**



**WHITEHEAD  
METALS, INC.**



INDUSTRIAL PRODUCTS

WEIGHTS

MONEL-NICKEL

FOUNDRY • WELDING



# WHITEHEAD METALS, INC.

A Corporate Division of Metal Goods Corporation

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SERVICE CENTERS  
GEARED TO GIVE  
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# METALOG

## STOCK LIST AND METAL MANUAL 23

### GENERAL OFFICES



WHITEHEAD METALS, INC.

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METAL GOODS CORPORATION

ST. LOUIS, MISSOURI

ALUMINUM

SHEET • DIAPY ROD • SHAPES • WIRE

TUBING • PIPE

BRASS

STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

COPPER

WEIGHTS  
MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

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METAL**

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BUFFALO, NEW YORK





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Hartford, Connecticut Service Center



SYRACUSE, NEW YORK

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MONEL-NICKEL

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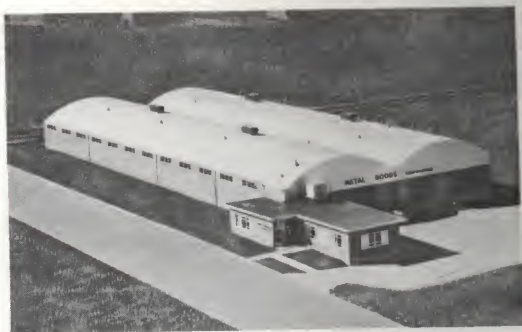
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# M E T A L G O O D S



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NEW ORLEANS, LOUISIANA



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# GENERAL INFORMATION

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METAL  
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**ORDERS:** It is of utmost importance that exact specifications be given in every order. Feet, inches, pounds, ounces, pieces, gauges, finish, length, width, tempers, etc., should be carefully included. The large variety of alloys, tempers, anneals and finishes make it essential, on initial orders particularly, that information be given as to the use for which the material is intended. This will aid considerably in the proper fulfillment of your requirement.

**GAUGES:** The use of the Micrometer to determine the thickness of metal or the size of wire in decimal parts of an inch, and the abolition of all gauge numbers when ordering, is strongly recommended. A comparison of gauges and decimal equivalents is included in the Data Section of this book.

**DIAMETER MEASUREMENTS:** When ordering Seamless Tubes, state whether the diameter given is "inside" or "outside", otherwise it will be considered that outside measurements are specified.

**ESTIMATING PRICES:** Prices of most metals in their various forms are usually determined by means of a base price applying only to certain gauges and widths and to which must be added extra charges for variations from these sizes and quantity extras. All orders are subject to minimum charges if applicable.

**CONFIRMATION ORDERS:** Confirmation orders should be plainly marked on the face of the order "Confirmation" in large letters. Unless so marked, confirmation orders may be treated as originals and filled in duplicate. In such cases we will not be responsible for the expense and inconvenience involved.



**TELEPHONE SERVICE:** A well-trained staff of men at each office is always at hand to help you either by telephone or personal call. These men are thoroughly experienced in manufacturing and maintenance problems. Though you have no immediate order, do not hesitate to bring your problem to them.

**DELIVERIES:** As a rule material from our warehouses is shipped the same day the order is received.

Telephone orders are accepted at the risk of the customer and shipments made before the receipt of confirmation are for the special convenience of the customer.

Promises of delivery on special orders are estimated as carefully as possible and although we do our best to ship within the time mentioned, we cannot guarantee to do so.

**WEIGHTS:** The weights given in this book are theoretical and variations must be expected in practice.

**SIZES:** Stock sizes change from time to time, and if the one you desire is not listed get in touch with us.

## TERMS AND CONDITIONS OF SALE

All orders are accepted subject to prior sale and subject to our sales and credit terms and conditions only, and not to the terms and conditions appearing on Buyer's purchase order or contract. Your agreement with our terms and conditions shall be conclusively evidenced by your acceptance of any shipment.

Said terms and conditions are as follows:

**PRICES:** All price quotations made by us or our agents are subject to change without notice. Prices in effect on date of shipment will prevail unless otherwise agreed to by us in writing. Prices quoted are F.O.B. our warehouse except when delivery is made by us within the free delivery areas which may be designated from time to time by our warehouses (or as otherwise specified). Appropriate charges will be made for packaging small or broken case shipments. Shipments made without packaging at the request of the Buyer shall be at the risk of the Buyer. If partial shipments are made at request of Buyer, boxing charges and quantity extras will be charged if applicable.

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**COMMODITIES:** All orders (or contracts) are accepted with the understanding they are subject to our ability to obtain the necessary commodities, and all orders (or contracts) as well as shipments applicable to such orders (or contracts), are subject to our current delivery schedules and to any Government Regulations that may be applicable.

**TAXES:** Prices indicated, unless otherwise agreed in writing, are exclusive of any present or future Federal, State, County or Municipal or other sales, use or excise tax upon or measured by the receipts from the sale or by the value of the material sold. Such taxes, if paid or required to be paid by us, shall be added to and become part of the price payable by the Buyer hereunder.

**TERMS OF PAYMENT:** If credit is approved by us, terms of payment are net cash 30 days, unless a discount for prompt payment applies. Prompt payment discounts vary with different commodities according to industry practice, and shall be such, if any, as are shown on the invoice covering the commodities sold. Such discounts shall apply to invoices dated the 1st to the 15th inclusive, if paid on or before the 25th of the month; to invoices dated the 16th to and including the last day of the month, if paid on or before the 10th of the following month. Invoices will be dated not earlier than the day of shipment.

On accounts not paid within 30 days from the end of the month in which invoices are rendered, interest will be charged at the rate of 6% per annum. Terms on tools, fixtures and fitting-up charges are net cash.

**DELAY IN DELIVERY:** We will endeavor to ship material within specified time, but this is not guaranteed. We will not be liable for any delay in the performance of orders or contracts, or in the delivery or shipment of goods, or for non-delivery, or for any damages suffered by Buyer by reason of such delay or non-delivery, when same is, directly or indirectly, caused by, or in any manner arises from fires, floods, accidents, riots, acts of God, war, governmental interference or embargoes, strikes, labor difficulties, shortage of labor, fuel, power, materials or supplies, transportation delays, or any other cause or causes (whether or not similar in nature to any of these hereinbefore specified) beyond our control. In no event shall we be liable for special or consequential damages.



**WARRANTY.** Should any of the material sold by us prove defective or below standard, Buyer shall not return the goods, but shall cease its use and shall notify us, stating full particulars in support of his claim, and we will either replace goods upon return of the defective or below standard material or adjust the matter fairly and promptly, but under no circumstances shall we be obligated for consequential or other damages, labor, losses or expenses in connection with or by reason of the use of or inability to use materials purchased for any purpose. The advice of our staff is available to the trade, but we, not controlling or supervising the subsequent manufacture, fabrication or installation of our products or their use after sale, do not warrant or guarantee such advice. No warranty or guarantee as to materials or fitness thereof for any purpose is made unless the same is specifically set forth in contract of purchase or acknowledgment of order, but in such case such warranty or guarantee is limited as above provided.

Materials furnished by us are subject to standard commercial tolerances unless otherwise provided hereon.

Any claim that material fails to conform to specifications or is defective shall be deemed waived by Buyer unless made in writing within 60 days from the date of shipment of the material to which such claim relates.

**PATENT INFRINGEMENT:** If any materials shall be sold by us to meet Buyer's particular specifications or requirements and are not part of our standard line offered by us to the trade generally in the usual course of our business, Buyer agrees to defend, protect and save us harmless against all suits at law or in equity and from all damage, claims and demands for actual or alleged infringement of any United States or foreign patent, and to defend any suit or actions which may be brought against us for any alleged infringement because of the sale of the material ordered by Buyer.

**CANCELLATIONS AND RETURNS:** Any request by Buyer for cancellation or alteration of an order, to be binding upon us, must be accepted by us in writing, and, at our option, will be subject to fair charges for expenses incurred and work executed by us or our suppliers up to the time of acceptance by us of such request.

Delivered materials returned to us will be accepted only if our prior written consent has been secured. Handling, inspection, restocking and invoicing charges will be assessed if applicable, with a minimum charge of

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\$2.50 plus any outgoing packing and freight expenditures paid by us. All returns allowed must be shipped to us prepaid and must be in excellent resale condition. Materials cut to Buyer's specifications are not returnable. No modification of or addition to or waiver of any of the above terms and conditions shall be effective unless agreed to in writing by an authorized officer of seller.

**DELIVERY:** Except when delivery is made by us within our free delivery areas, or unless we otherwise specify, delivery will be made F.O.B. our warehouse, and title and risk of loss shall pass to Buyer at that point. We reserve the right to select means and route of shipment of order when specific instructions are not included in the order.

**FOUNDRY PRODUCTS:** Unless otherwise agreed in writing between Buyer and Seller, the results of pressure tests, X-ray examinations, fluorescent penetrant examinations or other comparable inspection procedures, and variance of material from blueprints if such material has been made from pattern or core box equipment supplied by Buyer, shall not constitute a basis for rejection of material by Buyer. All costs of transportation, repair, alteration and packing of Buyer's equipment necessary for production of material will be paid by Buyer. Seller shall not be responsible for loss or damage to Buyer's pattern or core box equipment if caused directly or indirectly by acts of God, wars, fires, floods, civil or labor commotions, or any cause reasonably beyond Seller's control.

**WELDING MATERIALS:** The stability of the flux covering will vary, depending on storage conditions. The fumes from the burning coverings of electrodes may be injurious to personnel when such electrodes are used in inadequately ventilated spaces. Seller will not be liable for damages or injuries directly or indirectly caused by fumes resulting from the use of electrodes.

# SPECIAL SERVICES



ROLLER-  
LEVELING

SHEARING

SLITTING

CUTTING

Need metals in special sizes to meet the exact size requirements of your application? Then take advantage of our roller-leveling, shearing, slitting, and cutting services. All are done on modern, efficient equipment. These services, in many cases, eliminate all or most of your scrap losses. It will pay you to investigate the next time you have a problem involving special sizes.

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## a

**MODE**  
**METAL**  
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**YOUR**  
**METAL**

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**STAINLESS STEEL**  
**ALUMINUM**

TUBING • PIPE

## BRASS

STRUCTURAL SHAPES

**EXTRUDED SHAPES  
• CASTINGS**

## COPPER

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STAINLESS STEEL  
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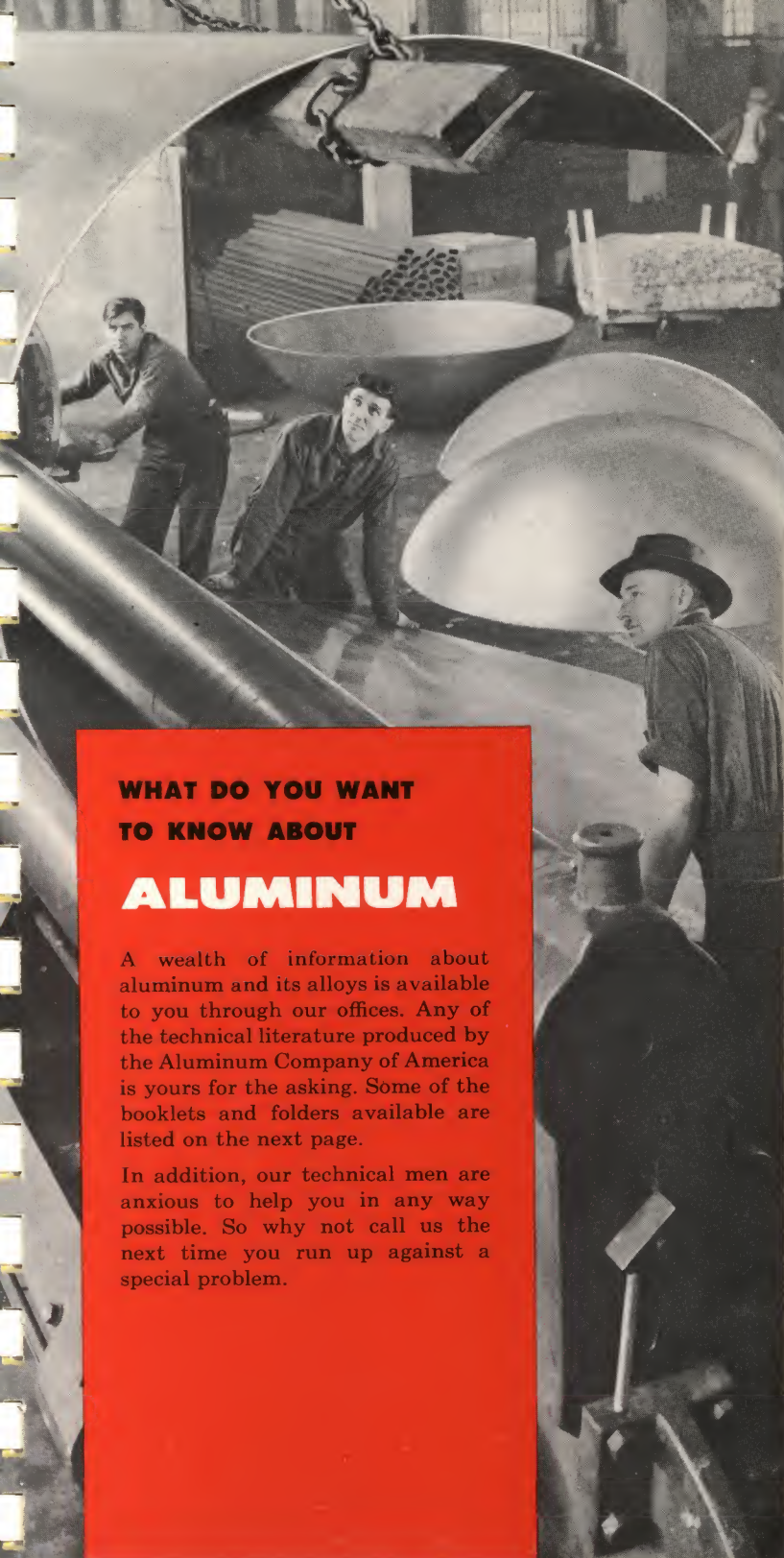
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**WHAT DO YOU WANT  
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# ALUMINUM

Stocks change from time to time. If the material you want is not listed here, call or write our office nearest you for additional information.

## LITERATURE ON ALUMINUM

Here are a few of the booklets published by the Aluminum Company of America that are available to you. This literature is free, and may be obtained by calling or writing our office nearest you.

Aluminum Handbook  
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Machining Aluminum  
Brazing Aluminum  
Welding Aluminum  
Riveting Aluminum  
Aluminum in Automatic  
  Screw Machines  
Aluminum Bus Bar  
Aluminum Bus Conductor  
  Handbook  
Structural Handbook  
Aluminum in Architecture  
Roofing and Siding Products  
Finishes For Aluminum  
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## DATA AND WEIGHTS

Tables showing physical and chemical properties, weights, and other useful information on aluminum are shown in the Data and Weights sections of this catalog. Call our nearest warehouse sales office on special problems.

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# ALUMINUM ASSOCIATION ALLOY DESIGNATION SYSTEM

## FOR ALCOA WROUGHT ALUMINUM

### 4 DIGIT SYSTEM

- 1st Digit
- 2nd Digit
- 3rd & 4th Digits

Identifies alloy types.  
Identifies alloy modification. Digit replaces letters formerly used. For example, A17S becomes 2117.  
Identify the aluminum purity or the specific aluminum alloy. The digits are the same as the numbers in the old designation for alloys in use prior to the adoption of the four digit system. For example, 24S becomes 2024.

### ALLOY GROUPS

- 1XXX
- 2XXX
- 3XXX
- 4XXX
- 5XXX
- 6XXX
- 7XXX
- 8XXX
- 9XXX

**Type of Aluminum Alloy**  
Aluminum — 99.00% minimum and greater  
Copper  
Manganese  
Silicon  
Magnesium  
Magnesium and Silicon  
Zinc  
Other Element  
Unused series

### Experimental

Letter "X" precedes four digits. For example, X8280.

### Temper

Temper designation follows alloy designation. They are separated by a dash. It employs the letters "O" or "F", "H" or "T" followed by one or more numbers. For example, 1100-O, 5052-H34, 6061-T651, 3003-F.

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MONEL-NICKEL

WEIGHTS

## NEW TEMPER DESIGNATIONS FOR STRESS RELIEVED ALUMINUM ALLOYS

For most alloys, the new temper designation system utilizes three digits after the letter "T". The first digit indicates the basic temper. The second digit "5" means the material has received stress relief treatment. The third digit indicates the method used to effect stress relief — numeral "1" denotes stretching, numeral "2" denotes compression; numerals "3" through "9" are reserved for describing other methods of stress relief, if such methods are developed.

These new temper designations have been incorporated in the METALOG covering those alloys affected by the change. They are as follows:

### P L A T E

Old Designation	New Designation
2024-T4	2024-T351
2024-T4 Alclad	2024-T351 Alclad
6061-T6	6061-T651
7075-T6	7075-T651
7075-T6 Alclad	7075-T651 Alclad
7178-T6	7178-T651
7178-T6 Alclad	7178-T651 Alclad

### WIRE, ROD, BAR, STRUCTURALS

Old Designation	New Designation	Rounds-Diameter
2017-T4	2017-T451	$\frac{1}{2}$ " — $6\frac{3}{4}$ "
2024-T4	2024-T351	$\frac{1}{2}$ " — $6\frac{1}{4}$ "
6061-T6	6061-T651	$\frac{1}{2}$ " — 8"
7075-T6	7075-T651	$\frac{1}{2}$ " — $6\frac{1}{4}$ "

The temper designations above apply also to the alloys of square, rectangular, and hexagon shaped stocks measuring one-half inch minimum across flats, thickness, or width. The maximum limit for these shapes is larger than any of the material stocked by Whitehead Metals, Inc.



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HUmbo  
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TRowbr  
Dir. Dist  
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**PHILAD**  
1955 W.  
BALdw  
Dir. Dist  
TWX-21



# ALUMINUM SHEET AND PLATE WEIGHT TABLE

Pounds Per  
Square Foot

B. & S. Gauge Number	Thickness (in inches)	Approx. Wt. Per Sq. Ft.	
		Sheet	Plate
-	*.190	2.68	-
-	.188	2.65	-
-	*.160	2.26	-
-	.156	2.21	-
-	*.125	1.76	-
10	.102	1.44	-
-	*.100	1.41	-
11	.091	1.28	-
-	*.090	1.27	-
12	.081	1.14	-
-	*.080	1.13	-
13	.072	1.04	-
-	*.071	1.00	-
14	.064	.904	-
-	*.063	.889	-
16	.051	.720	-
-	*.050	.706	-
18	*.040	.565	-
20	*.032	.452	-
22	*.025	.353	-
24	*.020	.282	-
-	.019	.268	-
26	*.016	.226	-
28	.012	.178	-
30	.010	.141	-
32	.008	.113	-
34	.006	.089	-
-	3.000	-	42.33
-	2.500	-	35.28
-	2.000	-	28.22
-	1.750	-	24.69
-	1.500	-	21.17
-	1.250	-	17.64
-	1.000	-	14.11
-	.875	-	12.35
-	.750	-	10.58
-	.625	-	8.82
-	.500	-	7.06
-	.375	-	5.29
-	.313	-	4.41
-	.250	-	3.53

\*American Standard Preferred Thickness.

## NOTE

Above figures are based on 1100 (5005, 5357 and 6061) alloys.  
For weights of other alloys multiply by the following factors:

3003—1.01, 2024—1.02, 5050—.99,  
5052—0.99, 7075—1.03, 7178—1.04.

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# ALCOA ALUMINUM WROUGHT ALLOYS SELECTOR CHART

Alcoa Alloy	General Characteristics	Typical Uses
1100	Excellent forming qualities, resistance to corrosion, weldability, electrical conductivity.	Chemical equipment, tank cars, heat exchangers, storage tanks, sheet metal work, dials and name plates, cooking utensils, decorative parts, giftware, and reflectors. 1100-0 wire stock is often used as general purpose welding wire and where the assembly is Alumilite treated.
32 Alumilite	Excellent Alumilite finishing characteristics. Appearance match with 6063 after Alumilite.	Store fronts, light fixtures, appliance and automotive trim, giftware.
2011	Good machinability, unexcelled for free-cutting qualities, good mechanical properties.	Screw-machine products, machine parts, atomizer and hose parts, pipe stems, cigarette holders, tube fittings.
2017	Relatively high strength, combined with fair workability and good machinability.	Screw machine products, tube fittings, pulleys, gages, coat hangers, crochet and knitting needles.
2024	A high-strength material of adequate workability. Has largely superseded 2017 for structural applications. Use of 2024-0 is not recommended unless subsequently heat treated.	Aircraft parts, truck wheels, caul plates, piano hinges, luggage, scientific instruments, ski poles, fastening devices, veterinary and orthopedic braces and equipment.
Alclad 2024	Combines high strength of 2024 with excellent resistance to corrosion in T3 and T4 temper. Its appearance is good.	Aircraft frames and skins, venetian blind slats, railroad car roofs and sides, truck bodies, caul plates.
3003	Similar characteristics to 1100 but with slightly higher strength, good workability, weldability, resistance to corrosion. Low cost. 3003-H112 Plate: ASME Unfired Pressure Vessel Code Approved.	Ductwork, cooking utensils, ice cube trays, garage doors, awning slats, trailer and truck panels, refrigerator panels, gas lines, gasoline tanks, heat exchangers, pressure vessels, storage tanks, chemical equipment, drawn and spun parts, general sheet metal work.
Alclad 3003	Same as 3S, except has higher resistance to perforation under corrosive conditions.	Heat exchanger tubes, chemical equipment, swimming pools, tea kettles.
5005	Similar characteristics to 3003, but with finer grain structure. Good finishing characteristics.	Same as 3003. Useful where excessive finishing costs are encountered in the use of 3003 alloys due to surface roughness upon drawing.
5050	Intermediate strength, good finishing characteristics. 5050-0 Alcoa Utilitube can be used with compression or flare fittings, comparable to annealed copper.	Decorative refrigerator parts, cosmetic cases, general purpose tubing (Alcoa® Utilitube), for instrumentation lines, fuel, lubricant and gas lines. 5050 Flat Sheet is a good general-purpose sheet metal alloy where strengths greater than 3003 are required.



# ALCOA ALUMINUM WROUGHT ALLOYS SELECTOR CHART

Alcoa Alloy	General Characteristics	Typical Uses
5052	Excellent resistance to corrosion, especially marine environment; good workability, higher strength than 1100 or 3003. Good finishing characteristics. 5052-H112 Plate: ASME Unfired Pressure Vessel Code Approved.	Kitchen cabinets, small boats, home freezers, milk crates, bus and truck bodies, refrigerator trays, aircraft tube, fencing, fan blades, shoe eyelets. Sheet metal parts and home appliances. 5052-H112 Plate is often used in tankage, high temperature vessels.
5154	Excellent strength and ductility for welding alloys 3004, 5052 (and 5154 sheet and plate). Used in the consumable electrode welding process.	Often used where Alumilite finishing is required. For welds of maximum strength and ductility, particularly in thicknesses above 1/4".
5356	A special welding rod for specific uses where strengths greater than 5154 are required.	Consult your Aluminum Man.
5357	A grade of sheet especially suited for Alumilite finishing.	Ornamental trim, giftware.
6061	Combines relatively high strength, good workability and high resistance to corrosion; widely available. 6061-T6 Plate: ASME Unfired Pressure Vessel Code Approved.	Sailboats, canoes, truck and bus bodies, scaffolding, transmission towers, mine skips, furniture, chemical equipment, awnings, marine equipment, fire ladders, moldings, pipe. Uses for 6061-T6 Plate include tankage, tank fittings and flanges. Uses for 6061-T6 Tube and Pipe include general structural and high pressure applications, paper and textile rolls.
6063	High resistance to corrosion. Pleasing natural finish greatly enhanced by the Alumilite process. Adequate strength, low cost.	Irrigation pipe, awning supports, windows, store fronts, architectural trim, storm sash, thresholds, stair rails, general utility pipe.
6262	Good machinability with high-strength. Corrosion resistance and finishing characteristics are better than 2011, 2017, 2024, and equal to 6061.	Fittings and couplings, camera components, nuts and screw machine products where corrosion resistance, finish, strength and machinability are important.
7075	Very high strength and hardness.	Aircraft, keys. Used where higher strengths from 2024 are required.
Alclad 7075	Very high strength, excellent resistance to corrosion in the T6 temper. Used for highly stressed structural parts. The O temper combines formability with high strength after heat treating.	Aircraft. Used where higher strengths than Alclad 2024 are required.

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## ALUMINUM

## 1100-O COILED SHEET

One Side Bright Mill Finish

Arbor:

.032 and less — 6" I.D.

.040 and heavier — 12" I.D.

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot	Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.063	24	1.78	.020	12	.284
.050	24	1.41		18	.426
.040	24	1.138		24	.568
.032	12	.452	.016	12	.225
	18	.678	.012	12	.178
	24	.904	.010	12	.141
.025	12	.357			
	18	.536			
	24	.714			

## 1100-O COILED SHEET

Mill Finish

Arbor:

.032 and less — 6" I.D.

.040 and heavier — 12" I.D.

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.063	16	1.18
	18	1.33
	24	1.78
.050	18	1.06
	24	.141
.040	12	.569
	16	.756
	18	.853
	20	.948
	24	1.138
.032	16	.601
	18	.678
	20	.750
	24	.904
.025	18	.536
	24	.714
.020	18	.426
	24	.568
.016	12	.225
	18	.337
.012	12	.178
	18	.267
.010	12	.141
.008	12	.113

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TRowbr  
Dir. Dis  
TWX-61

**PHILAD**  
1955 W.  
Baldwin  
Dir. Dist  
TWX-21



# ALUMINUM

## 3003-H14 COILED SHEET

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.125	36	5.33
	48	7.11
.100	36	4.27
.080	24	2.29
	48	4.57
.063	24	1.796
	36	2.69
	48	3.59
.050	24	1.426
	36	2.14
	48	2.85
.040	12	.574
	24	1.15
	36	1.72
	48	2.29

Mill Finish

Arbor:

16"-20" I.D.

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.032	24	.912
	36	1.37
	48	1.82
.025	24	.721
	36	1.08
	48	1.44
.020	24	.572
	36	.861
.016	18	.340
	36	.680
.012	12	.180
.010	12	.143

## 5005-H34 COILED SHEET

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.125	36	5.28
	48	7.04
.100	36	4.23
	48	5.64
.090	36	3.81
	48	5.08
.080	36	3.39
	48	4.52
.063	36	2.67
	48	3.56

Mill Finish

Arbor:

18"-20" I.D.

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.050	36	2.12
	48	2.82
.040	36	1.71
	48	2.28
.032	36	1.36
	48	1.81
.025	36	1.07
	48	1.43
.020	36	.85
.016	36	.672

## 5052-H32 COILED SHEET

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.063	36	2.64
	48	3.52
.050	36	2.10
	48	2.80
.040	36	1.69
	48	2.25

Mill Finish

Arbor:

18"-20" I.D.

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.032	36	1.34
	48	1.79
.025	36	1.06
.020	36	.84

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WEIGHTS

INDUSTRIAL PRODUCTS

# ALUMINUM

## 5052-H34 COILED SHEET

Mill Finish

Arbor:  
18"-20" I.D.

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot	Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.063	36	2.64	.032	36	1.341
	48	3.52		48	1.788
.050	36	2.097	.025	36	1.059
	48	2.796	.020	36	.840
.040	36	1.689			
	48	2.252			

## 3105-H25 COILED SHEET

Arbor: 20" I.D.

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot	Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.050	36	2.139	.027	36	1.155
	48	2.852		48	1.540
.040	36	1.710	.024	36	1.026
	48	2.280		48	1.368
.032	36	1.368	.019	36	.813
	48	1.824		48	1.084

## 1100-O SHEET

Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.125	36 X 96	42.34	.040	24 X 72	6.77
.100	36 X 96	33.86		36 X 96	13.55
.090	36 X 96	30.48		48 X 144	27.09
.080	36 X 96	27.09	.032	24 X 72	5.42
.063	24 X 72	10.69		36 X 96	10.84
	36 X 96	21.34	.025	24 X 72	4.23
	48 X 144	42.67	.020	24 X 72	3.39
.050	24 X 72	8.47	.016	24 X 72	2.71
	36 X 96	16.93	.012	24 X 72	2.13
	48 X 144	33.87			

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TWX-60

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# ALUMINUM

## 1100-H14 SHEET

Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.190	36 X 96*	64.35	.040	24 X 72†	6.77
	48 X 144*	128.70		36 X 96	13.55
.125	36 X 96	42.34		36 X 120	17.07
	48 X 144	84.67		48 X 144	27.09
.100	36 X 96	33.86	.032	24 X 72†	5.42
	48 X 144	67.72		36 X 96	10.84
.090	36 X 96	30.48		36 X 120	13.56
	48 X 144	60.96		48 X 144	21.67
.080	36 X 96	27.09	.025	24 X 72†	4.23
	48 X 144	54.19		36 X 96	8.47
.063	24 X 72†	10.69		36 X 120	10.71
	36 X 96	21.34	.020	24 X 72†	3.39
	36 X 120	26.67		36 X 96	6.77
	48 X 144	42.67		36 X 120	8.52
.050	24 X 72†	8.47	.016	24 X 72†	2.71
	36 X 96	16.93		36 X 96	5.42
	36 X 120	21.18	.012	24 X 72†	2.13
	48 X 144	33.87	.010	24 X 72†	1.73

\*H24 Temper, halfhard obtained by strain hardening and partial annealing.

† Also available in Bright Finish, Interleaved

## 1100-H25 SHEET

Standard  
One Side Bright  
Mill Finish, Interleaved

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.050	36 X 96	16.93	.025	36 X 96	8.47
.040	36 X 96	13.55	.020	36 X 96	6.77
.032	36 X 96	10.84	.016	36 X 96	5.42

## 1100-F PLATE

Mill Finish, Mill Sheared Edge

Thickness (in inches)	Size (in inches)	Pounds Per Plate	Thickness (in inches)	Size (in inches)	Pounds Per Plate
1	36 X 96	338.68	.375	48 X 144	254.00
.750	36 X 96	254.00	.313	36 X 96	106.00
.500	36 X 96	169.34	.250	36 X 96	84.67
	48 X 144	338.64		48 X 144	169.34
.375	36 X 96	127.00		60 X 144	211.80

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## 3003-O SHEET

Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.125	36 X 96	42.76	.050	36 X 96	17.11
	48 X 144	85.54		48 X 144	34.21
.090	36 X 96	30.79	.040	36 X 96	13.68
	48 X 144	61.59		48 X 144	27.37
.080	36 X 96	27.37	.032	36 X 96	10.95
	48 X 144	54.74	.025	24 X 72	4.28
.063	36 X 96	21.55		36 X 96	8.55
.063	48 X 144	43.11	.020	36 X 96	6.84

## 3003-H14 SHEET

Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.190	36 X 96*	65.00	.050	36 X 120	21.38
	48 X 120*	108.40		48 X 96	22.82
	48 X 144*	130.00		48 X 120	28.51
.125	36 X 96	42.76		48 X 144	34.21
	36 X 120	53.40		60 X 144	42.77
	48 X 120	71.20	.040	36 X 96	13.68
	48 X 144†	85.54		36 X 120	17.11
	60 X 144	106.80		48 X 96	18.40
.100	36 X 96	34.08		48 X 120	22.81
	48 X 144	68.16		48 X 144	27.37
.090	36 X 96	30.79		60 X 144	34.21
	48 X 120	51.48	.032	36 X 96	10.95
	48 X 144	61.59		36 X 120	13.69
.080	36 X 96	27.37		48 X 96	14.59
	48 X 120	46.00		48 X 120	18.25
	48 X 144	54.74		48 X 144	21.90
	60 X 144	68.31	.025	36 X 96	8.55
.063	36 X 96	21.55		36 X 120	10.69
	36 X 120	26.94		48 X 144	17.11
	48 X 96	28.73	.020	24 X 72	3.42
	48 X 120	35.92		36 X 96	6.84
	48 X 144	43.11		36 X 120	8.55
	60 X 144	53.89	.016	24 X 72	2.74
.050	36 X 96	17.11			

† Also available in a Special  
Dull Finish.

\*H24 Temper



# ALUMINUM

## 3003-H25 SHEET

One Side Bright Mill Finish  
Interleaved

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.063	36 X 96	21.55	.040	48 X 144	27.37
	48 X 144	43.11	.032	36 X 96	10.95
.050	36 X 96	17.11	.025	36 X 96	8.55
	48 X 144	34.21	.020	36 X 96	6.84
.040	36 X 96	13.68			

## 3003-F PLATE

Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.250	36 X 96	85.54
.250	48 X 144	171.07

## 3105-H25 SHEET

Mill Finish

Also Available in Various  
Patterns

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.050	36 X 96	17.11
	48 X 120	28.51
	48 X 144	34.22
.040	36 X 96	13.68
	48 X 120	22.81
	48 X 144	27.36
.032	36 X 96	10.95
	48 X 120	18.25
	48 X 144	21.90
.027	36 X 96	9.24
	48 X 120	15.40
	48 X 144	18.48
.024	36 X 96	8.21
	48 X 120	13.68
	48 X 144	16.42
.019	36 X 96	6.50
	48 X 120	10.83
	48 X 144	13.00

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BRAZING PRODUCTS

# ALUMINUM

## #E5 STUCCO PATTERN SHEET

3003-H114 Flat Pattern Sheet  
Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.040	36 X 96	13.65
	48 X 144	27.37
.032	36 X 96	10.95
	48 X 144	21.90
.025	36 X 96	8.55
	48 X 144	17.11
.020	36 X 96	6.84

## 3003-H14 EXPANDED ALUMINUM SHEET

STOCK SIZES — 4 ft. x 8 ft.

Style Designation	STANDARD					FLATTENED				
	lbs. per Sq. ft.	Mesh Sizes (in inches)		Strand Siz. (in inches)		lbs. per Sq. ft.	Mesh Sizes (in inches)		Strand Siz. (in inches)	
		Wid. *	Len. *	Thick- ness	Width		Wid. *	Len. *	Thick- ness	Width
		SWD	LWD				SWD	LWD		
$\frac{1}{2}$ " NO..051"	.27	.462	1.20	.051	.8969	.25	.46	1.26	.045	.097
$\frac{1}{2}$ " NO..081"	.44	.462	1.20	.081	.0883	.41	.46	1.26	.067	.101
$\frac{3}{4}$ " NO..051"	.17	.923	2.00	.051	.1094	.16	.923	2.125	.040	.132
$\frac{3}{4}$ " NO..081"LT	.32	.923	2.00	.081	.1284	.30	.923	2.125	.070	.141
$\frac{3}{4}$ " NO..081"HY	.41	.923	2.00	.081	.1646	.38	.923	2.125	.070	.182
$\frac{3}{4}$ " NO..125"	.65	.923	2.00	.125	.1704	.61	.923	2.125	.095	.212
$1\frac{1}{2}$ " NO..081"	.22	1.33	3.00	.081	.1275	.20	1.33	3.125	.070	.138
$1\frac{1}{2}$ " NO..125"	.43	1.33	3.00	.125	.1629	.40	1.33	3.125	.080	.240

\*S.W.D. denotes short dimension of diamond; L.W.D. denotes long dimension of diamond. Sheet width is measured in the direction of the short dimension of the diamond, and sheet length is measured in the direction of the long dimension of the diamond.

## #10 FLUTED PATTERN SHEET

3003-H114 Flat Pattern Sheet  
Mill Finish, Interleaved

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.063	48 X 144	43.7
.050	48 X 144	34.7
.040	48 X 144	27.6
	48 X 120	22.8
	48 X 96	18.4

ALUMINUM

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TWX-617

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# ALUMINUM

## #10 FLUTED PATTERN SHEET

5005-H114 Flat Pattern Sheet  
Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.063	48 X 144	42.67
.050	48 X 144	33.87
.040	48 X 144	27.09

## #E13 DIAMOND PATTERN SHEET

3003-H114 Flat Pattern Sheet  
Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.040	48 X 144	27.6
.032	48 X 144	21.9
.025	48 X 144	17.3

## #E14 SQUARE PATTERN SHEET

3003-H114 Flat Pattern Sheet  
Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.040	48 X 144	27.37	.032	48 X 144	21.90

## #E15 LEATHER GRAIN

3003-H114 Flat Pattern Sheet  
Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.040	48 X 144	27.37	.025	48 X 144*	17.10
.032	48 X 120*	18.25			
	48 X 144	21.90			

\*H154 Temper

## LIGHTING SHEET - TYPE I

1100-H18  
Specular Finish, Interleaved

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.032~	24 X 72	5.4	.020	24 X 72	3.4
.025	24 X 72	4.3			

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## LIGHTING SHEET—TYPE II

1100-H18  
Specular Finish, Interleaved

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.032	24 X 72	5.4
	24 X 96	7.2
.025	24 X 72	4.3

## ANOCALD SHEET

Description	Thickness & Size (in inches)	Temper	Pounds Per Sheet
TYPE 10, PLAIN FINISH	.125 X 48 X 144	H24	84.5
	.063 X 48 X 144	H14	42.7
TYPE 10, #10 FLUTED FINISH	.125 X 48 X 144	H114	84.5
	.063 X 48 X 144	H154	42.7
TYPE 20, PLAIN FINISH	.125 X 48 X 144	H24	84.5
	.063 X 48 X 144	H14	42.7
TYPE 20, #10 FLUTED FINISH	.125 X 48 X 144	H114	84.5
	.063 X 48 X 144	H154	42.7

## NO. 32 ALUMILITE\* SHEET

Thickness (in inches)	Size (in inches)	Temper	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Temper	Pounds Per Sheet
.125	36 X 120	H24	52.92	.040	36 X 96	H14 & H26	13.54
	48 X 120	"	70.56		36 X 120	"	16.93
	48 X 144	"	84.67		48 X 96	H14	18.06
.090	48 X 144	H14 & H26	60.68		48 X 120	"	22.58
.063	36 X 120	"	26.66		48 X 144	H14 & H26	27.10
	48 X 144	"	42.62		36 X 96	"	10.82
.050	36 X 96	"	16.94	.032	36 X 120	"	13.52
	36 X 120	"	21.17		48 X 96	"	14.46
	48 X 96	H14	22.58		48 X 120	H14	18.07
	48 X 120	"	28.22		48 X 144	"	21.73
	48 X 144	"	33.87				

\*Aluminum sheet with a surface quality developed for applications of protective and decorative coatings in natural or colored finished by the Alumilite process.

ALUMINUM

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HUmbold  
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Dir. Dist.  
TWX-617  
PHILADE  
1955 W. F  
Baldwin  
Dir. Dist.  
TWX-215



# ALUMINUM

## #718-F BRAZING SHEET

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.010	6 X 24	.145
.015	6 X 24	.218

## 5005-H34 SHEET

### Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Pounds Per Sheet
*.125	36 X 96	42.34	.050	48 X 120	28.24
	36 X 120	52.80		48 X 144	33.87
	48 X 120	70.40	.040	36 X 96	13.55
.100	48 X 144	84.67		36 X 120	17.07
	36 X 96	33.84		48 X 96	18.29
	48 X 144	67.68	.032	48 X 120	22.76
.090	36 X 96	30.48		48 X 144	27.09
	48 X 144	60.96		36 X 96	10.84
.080	36 X 96	27.09	.025	36 X 120	13.56
	36 X 120	33.90		48 X 96	14.46
	48 X 120	45.20		48 X 120	18.08
.063	48 X 144	54.19	.020	48 X 144	21.67
	36 X 96	21.34		36 X 96	8.47
	36 X 120	26.67		36 X 120	10.71
.050	48 X 96	28.45	.016	48 X 96	11.42
	48 X 120	35.56		48 X 120	14.28
	48 X 144	42.67		48 X 144	16.94
	36 X 96	16.93		36 X 96	6.77
	36 X 120	21.18		36 X 120	8.52
	48 X 96	22.59		36 X 96	5.42
				36 X 120	6.72

\*Furnished in H24 Temper only

## 5052-O SHEET

### Mill Finish

### .040 and heavier Interleaved

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.190	48 X 144	126.0	.050	48 X 144	33.2
.125	48 X 144	82.6		36 X 96	13.3
.090	48 X 144	59.8		48 X 144	26.7
.080	48 X 144	53.1		36 X 96	10.6
.063	36 X 96	20.9	.032	48 X 144	21.2
	48 X 144	41.8		36 X 96	8.4
.050	36 X 96	16.6		36 X 96	6.7

STAINLESS STEEL

WIRE • ROD • BAR

TUBING • PIPE

STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

# ALUMINUM

## 5052-H32 SHEET

Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.190	36 X 96*	63.69	.050	36 X 96	16.76
	48 X 144*	127.39		48 X 96	22.35
.125	36 X 90	39.14		48 X 144	33.52
	36 X 96	41.90	.040	36 X 96	13.41
	48 X 96	55.04		36 X 144	20.27
	48 X 144	83.81		48 X 96	17.88
.100	48 X 144	66.40		48 X 144	26.82
.090	36 X 90	28.12	.032	36 X 96	10.73
	36 X 96	30.17		48 X 96	14.30
	48 X 96	40.23		48 X 144	21.45
	48 X 120	50.44	.025	36 X 96	8.38
	48 X 144	60.52		36 X 144	12.57
.080	36 X 96	26.82	.020	36 X 96	6.70
	48 X 96	35.76		36 X 144	10.06
	48 X 144	53.64			
.063	36 X 96	21.12			
	48 X 96	28.16			
	48 X 120	35.20			
	48 X 144	42.24			

\*H22 Temper

## 5052-H34 SHEET

Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.190	48 X 72	63.69	.050	48 X 144	33.52
	48 X 144	127.39	.040	36 X 96	13.41
.125	48 X 144	83.81		36 X 120	16.89
	48 X 144	67.20		48 X 96	17.88
.100	48 X 144	67.20		48 X 120	22.52
.090	48 X 144	60.34	.032	48 X 144	26.82
.080	48 X 144	53.64		36 X 96	10.73
	36 X 96	21.12		48 X 96	14.30
.063	36 X 120	26.40		48 X 120	17.88
	48 X 120	35.20	.025	48 X 144	21.45
	48 X 144	42.24		36 X 96	8.38
.050	36 X 96	16.76	.020	36 X 96	6.70
	36 X 120	20.97			
	48 X 96	22.35			
	48 X 120	27.96			

## 5052-F PLATE

Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Plate
.250	36 X 96	84
	48 X 144	168
	60 X 144	210

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CAMBRI

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Dir. Dist.

TWX-617

PHILADE

1955 W. H

BALDwin S

Dir. Dist.

TWX-215-



# ALUMINUM

## 5086-H32 SHEET AND PLATE

Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
1.5000	36 X 96	497.66
1.250	36 X 96	414.72
1.000	36 X 96	331.78
.750	36 X 96	248.84
.500	36 X 96	165.89
.375	36 X 96	124.42
.313	48 X 144	202.68
.250	48 X 144	165.89

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.190	48 X 144	126.26
.125	48 X 144	82.94
.090	48 X 96	39.94
	48 X 144	59.90
	60 X 96	49.92
	60 X 120	62.40
.063	48 X 144	41.79

## 5454-H32 SHEET AND PLATE

Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.190	48 X 144	126.07

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.125	48 X 144	82.94

## 5456-H321 PLATE

Mill Finish

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
1.000	60 X 144	829.44
.750	60 X 144	622.08
.500	60 X 144	414.72
.375	60 X 144	311.04
.250	60 X 144	207.36

## 6061-O SHEET AND PLATE

Mill Finish

Identified and Interleaved

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.250	48 X 144	169.34
.190	48 X 144	128.70
.125	48 X 144	84.67
.100	48 X 144	67.74
.090	48 X 144	60.96
.080	48 X 144	54.19

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.063	48 X 144	42.67
.050	48 X 144	33.87
.040	48 X 144	27.09
.032	48 X 144	21.67
.025	36 X 144	12.70
.012	36 X 96	5.18

## 6061-T4 SHEET

Mill Finish

Identified and Interleaved

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.190	48 X 144	128.70
.125	48 X 144	84.67
.090	48 X 144	60.96
.080	48 X 144	54.19
.063	48 X 144	42.67

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.050	48 X 144	33.87
.040	48 X 144	27.09
.032	48 X 144	21.67
.025	36 X 144	12.70

STAINLESS STEEL

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STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

# ALUMINUM

## 6061-T6 SHEET

Mill Finish  
Identified and Oiled

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.190	48 X 144	128.70	.080	48 X 144	54.19
	60 X 144	160.80		60 X 144	68.40
	72 X 144	192.96	.063	36 X 96	21.33
.160	48 X 144	108.38		48 X 144	42.67
	36 X 144	63.36	.050	36 X 96	16.93
.125	48 X 96	56.32		48 X 144	33.87
	48 X 144	84.67	.040	36 X 96	13.54
	60 X 144	105.60		48 X 144	27.09
.100	48 X 144	67.74	.032	36 X 96	10.83
	60 X 144	84.60		48 X 144	21.67
.090	48 X 144	60.96	.025	36 X 144	12.70

## 6061-T651 PLATE

Mill Finish  
Identified and Interleaved

Thickness (in inches)	Size (in inches)	Pounds Per Plate	Thickness (in inches)	Size (in inches)	Pounds Per Plate
3.000	36 X 96	1016.04	.750	36 X 96	254.01
2.500	36 X 96	846.70		48 X 144	508.02
2.000	36 X 96	677.36	.625	36 X 96	211.68
	48 X 144	1354.72		48 X 144	423.35
1.750	36 X 96	592.69	.500	36 X 96	169.34
	48 X 144	1185.38		48 X 144	338.68
1.500	36 X 96	508.02	.375	72 X 144	508.02
	48 X 144	1016.04		36 X 96	127.01
1.250	48 X 144	846.70	.313	48 X 144	254.01
	36 X 96	423.36		36 X 96	106.00
1.000	36 X 96	338.68	.250	36 X 96	84.67
	48 X 144	677.36		48 X 144	169.34
	72 X 144	1016.04		60 X 144	211.68
.875	48 X 144	592.69		60 X 240	352.80
				72 X 144	254.01

## 3003 ABRASIVE TREAD PLATE

Thickness (in inches)	Size (in inches)	Pounds	
		Plate	Sq. Ft.
.250	48X144	163.20	3.4
.188	48X144	124.80	2.6
.125	48X144	81.60	1.7

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TWX-20

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281 Alba  
TRowbri  
Dir. Dist  
TWX-61

PHILAD  
1955 W.  
BALdwin  
Dir. Dist  
TWX-21



# ALUMINUM

## 6061-T6 TREAD PLATE

Mill Finish, Pattern C-102

Thickness (in inches)	Size (in inches)	Pounds		Thickness (in inches)	Size (in inches)	Pounds	
		Plate	Sq. Ft.			Plate	Sq. Ft.
.250	36X144	133.20	3.7	.156	48X192	140.8	2.2
	48X192	236.8	"		60X192	176	"
	60X192	296	"	.125	48X192	121.6	1.9
.188	48X192	179.2	2.8		60X192	152.0	"
	60X192	224	"		48X192	89.6	1.4

## 2024-O BARE PLATE

Mill Finish  
Identified and Oiled

Thickness (in inches)	Size (in inches)	Pounds Per Plate
.250	48 X 144	172.80

## 2024-O BARE SHEET

Mill Finish  
Identified and Oiled

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.190	48 X 144	131.33
.160	48 X 144	110.59
.125	48 X 144	86.40
.100	48 X 144	69.12
.090	48 X 144	62.21
.080	48 X 144	55.22
.071	48 X 144	49.08
.063	48 X 144	43.55
.050	48 X 144	34.56
.040	48 X 144	27.65
.032	48 X 144	22.12
.025	48 X 144	17.28

## 2024-T3 BARE SHEET

Mill Finish  
Identified and Oiled

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.190	36 X 96	65.76	.071	48 X 144	49.08
	48 X 144	131.33		48 X 144	43.55
.160	48 X 144	110.59	.050	48 X 144	34.56
	36 X 96	43.20		48 X 144	27.65
.125	48 X 144	86.40	.032	48 X 144	22.12
	48 X 144	69.12		48 X 144	17.28
.100	48 X 144	62.21	.020	36 X 144	10.37
	48 X 144	55.22			

STAINLESS STEEL

WIRE • ROD • BAR

TUBING • PIPE

BRASS

STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

WEIGHTS

DATA

# ALUMINUM

ALUMINUM

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TWX-20

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281 Albar  
TRowbric  
Dir. Dist  
TWX-617

PHILAD  
1955 W. E  
Baldwin  
Dir. Dist.  
TWX-215

## 2024-T351 BARE PLATE

Thickness (in inches)	Size (in inches)	Pounds Per Plate
3.000	36 X 96	1036.80
2.500	36 X 96	864.00
2.000	24 X 72	345.60
	36 X 96	691.20
	48 X 144	1382.40
1.750	24 X 72	302.40
	36 X 96	604.80
	48 X 144	1209.60
1.500	24 X 72	259.20
	36 X 96	518.40
	48 X 144	1036.80
1.250	24 X 72	216.00
	36 X 96	432.00
	48 X 144	864.00
1.000	24 X 72	172.80
	36 X 96	345.60
	48 X 144	691.20
.875	24 X 72	151.20
	36 X 96	302.40

Mill Finish

Identified and Oiled

Thickness (in inches)	Size (in inches)	Pounds Per Plate
.750	48 X 144	604.80
	24 X 72	129.60
	36 X 96	259.20
	48 X 144	518.40
.625	24 X 72	108.00
	36 X 96	216.00
	48 X 144	432.00
.500	24 X 72	86.40
	36 X 96	172.80
	48 X 144	345.60
.375	24 X 72	64.80
	36 X 96	129.60
	48 X 144	259.20
.313	24 X 72	54.09
	36 X 96	108.17
	48 X 144	216.34
.250	24 X 72	43.20
	36 X 96	86.40
	48 X 144	172.80
	60 X 144	216.00

## 2024-O ALCLAD SHEET

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.190	48 X 144	131.33
.160	48 X 144	110.59
.125	48 X 144	86.40
.100	48 X 144	69.12
.090	48 X 144	62.21
.080	48 X 144	55.22
.071	48 X 144	49.08
.063	48 X 144	43.55

Mill Finish

Identified and Interleaved

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.050	48 X 144	34.56
.040	48 X 144	27.65
.032	48 X 144	22.12
.025	48 X 144	17.28
.020	36 X 144	10.37
	48 X 144	13.83
.016	36 X 144	8.29

## 2024-O ALCLAD PLATE

Thickness (in inches)	Size (in inches)	Pounds Per Plate
.250	48 X 144	172.80

Mill Finish

Identified and Interleaved



# ALUMINUM

## 2024-T3 ALCLAD SHEET

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.190	48 X 144	131.33
.160	48 X 144	110.59
.125	48 X 144	86.40
.100	48 X 144	69.12
.090	48 X 144	62.21
.080	48 X 144	55.22
.071	48 X 144	49.08
.063	48 X 144	43.55
.050	48 X 96	23.04
	48 X 120	28.80
	48 X 144	34.56

Mill Finish

Identified and Interleaved

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.040	48 X 96	18.43
	48 X 120	23.20
	48 X 144	27.65
.032	48 X 144	22.12
.025	48 X 144	17.28
.020	36 X 144	10.37
	48 X 144	13.83
.016	36 X 144	8.29
	48 X 144	11.06
.012	48 X 144	8.73

## 2024-T351 ALCLAD PLATE

Thickness (in inches)	Size (in inches)	Pounds Per Plate
.250	48 X 144	172.80

Mill Finish

Identified and Interleaved

## 7075-T6 BARE SHEET AND

## 7075-T651 BARE PLATE

Thickness (in inches)	Size (in inches)	Pounds Per Plate
3.000	36 X 96	1046.88
2.000	24 X 72	348.96
	36 X 96	697.92
1.750	36 X 96	610.80
1.500	24 X 72	261.72
	36 X 96	523.44
1.250	24 X 72	218.10
	36 X 96	436.20
1.000	36 X 96	348.96
.875	36 X 96	305.52
.750	36 X 96	261.84
.625	36 X 96	218.16
.500	36 X 96	174.48
.375	36 X 96	130.80
	48 X 144	261.60

Mill Finish

Identified and Oiled

Thickness (in inches)	Size (in inches)	Pounds Per Plate
.313	36 X 96	109.20
.250	48 X 144	174.50
.125	48 X 144	87.26
.100	48 X 144	69.81
.090	48 X 144	63.02
.071	48 X 144	49.45
.063	48 X 144	43.97
.050	48 X 144	34.91
.040	48 X 144	27.92
.032	48 X 144	22.35
.025	48 X 144	17.45
.020	48 X 144	13.96
.016	48 X 144	11.15

STAINLESS STEEL

WIRE • ROD • BA

TUBING • PIPE

BRASS

STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

COPPER

INDUSTRIAL PRODUCTS

WEIGHTS

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

## ALUMINUM

7075-O BARE  
SHEET

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.125	48 X 144	87.26
.100	48 X 144	69.81
.090	48 X 144	63.02
.071	48 X 144	49.45
.063	48 X 144	43.97

## Mill Finish

## Identified and Interleaved

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.050	48 X 144	34.91
.032	48 X 144	22.35
.025	48 X 144	17.45
.020	48 X 144	11.15

7075-O ALCLAD  
SHEET

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.190	48 X 144	132.64
.160	48 X 144	111.69
.125	48 X 144	87.26
.100	48 X 144	69.81
.090	48 X 144	62.83
.080	48 X 144	55.77
.071	48 X 144	49.57
.063	48 X 144	43.99

## Mill Finish

## Identified and Interleaved

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.050	48 X 144	34.90
.040	48 X 144	27.93
.032	48 X 144	22.34
.025	36 X 144	13.09
.020	36 X 144	10.47
	48 X 144	13.97
.016	36 X 144	8.32

7075-T6 ALCLAD  
SHEET

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.190	48 X 144	132.64
.160	48 X 144	111.69
.125	48 X 144	87.26
.100	48 X 144	69.81
.090	48 X 144	62.83
.080	48 X 144	55.77
.071	48 X 144	49.57
.063	48 X 144	43.99
.050	48 X 144	34.90

## Mill Finish

## Identified and Interleaved

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.040	48 X 144	27.93
.032	48 X 144	22.34
.025	36 X 144	13.09
	48 X 144	17.45
.020	36 X 144	10.47
	48 X 144	13.97
.016	36 X 144	8.32
	48 X 144	11.17
.012	48 X 144	8.54

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TWX-20

CAMBR  
281 Alba  
TRowbri  
Dir. Dist  
TWX-61

PHILAD  
1955 W.  
Baldwin  
Dir. Dist  
TWX-21



# ALUMINUM

## TOOL AND JIG PLATE

TYPE 300 - Cast

Thickness (in inches)	Size (in inches)	Weight per Plate	Thickness (in inches)	Size (in inches)	Weight per Plate
4	48 X 96	1862	1	48 X 96	465
3 1/2	48 X 96	1629	3/4	48 X 96	349
3	48 X 96	1396	5/8	48 X 96	291
2 1/2	48 X 96	1164	1/2	48 X 96	233
2	48 X 96	931	3/8	48 X 96	175
1 3/4	48 X 96	814	5/16	48 X 96	148
1 1/2	48 X 96	698	1/4	48 X 96	116
1 1/4	48 X 96	582			

## RIGIDIZED ALUMINUM SHEET

Aluminum Sheet is also available with rigidized patterns. There is a large number of attractive patterns to select from. It can be fabricated the same as plain flat-rolled metal. Call for additional information.

## INDUSTRIAL ROOFING, SIDING AND ACCESSORIES

### Corrugated Industrial Roofing and Siding

THICKNESS:	.024" AND .032"
LENGTHS:	INCREMENTS OF 6 INCHES .024" — 3' THRU 24' .032" — 3' THRU 30'
WIDTHS:	ROOFING 35" OVER-ALL (32" COVERAGE WITH 1 1/2 CORRUGATIONS SIDE LAP) 48 1/2" OVER-ALL (45 1/2" COVERAGE WITH 1 1/2 CORRUGATIONS SIDE LAP) SIDING 33 3/4" OVER-ALL (32" COVERAGE WITH 1 CORRUGATION SIDE LAP)
CORRUGATION:	2.67" PITCH X 7/8" DEPTH
WEIGHT:	.024" — 41.4 POUNDS PER 100 SQUARE FEET .032" — 55.2 POUNDS PER 100 SQUARE FEET
FINISH:	PLAIN MILL FINISH STUCCO EMBOSSED (E5 PATTERN) LOW SPECULAR GLOSS EMBOSSED WITH ALUMALURE FINISH

### Industrial Siding Sheet, 4-Inch Ribbed

THICKNESS:	.032" AND .040"
LENGTHS:	3' THRU 30' IN INCREMENTS OF 6 INCHES
WIDTHS:	41 5/8" OVER-ALL (40" COVERAGE WITH 1 RIB SIDE LAP)
RIB:	1" DEEP, 4" PITCH, 1 5/8" OUTER FLAT, 1 3/8" INNER FLAT
WEIGHT:	.032" — 57.5 POUNDS PER 100 SQUARE FEET .040" — 71.8 POUNDS PER 100 SQUARE FEET
FINISH:	STUCCO EMBOSSED EMBOSSED WITH ALUMALURE FINISH

STAINLESS STEEL

WIRE • ROD • BA

ROD • SHAPES • WIRE

INDUSTRIAL PRODUCTS

TUBING • PIPE

BRASS

STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

COPPER

MONEL-NICKEL

WEIGHTS

FOUNDRY • WELDING  
BRAZING PRODUCTS

# ALUMINUM

## INDUSTRIAL ROOFING, SIDING AND ACCESSORIES

### Industrial Siding Sheet, 8-Inch Ribbed

THICKNESS:	.032" AND .040"
LENGTHS:	3' THRU 30' IN INCREMENTS OF 6 INCHES
WIDTHS:	41 $\frac{5}{8}$ " OVER-ALL (40" COVERAGE WITH 1 RIB SIDE LAP)
RIB:	1" DEEP, 8" PITCH, 5 $\frac{5}{8}$ " OUTER FLAT, 1 $\frac{3}{8}$ " INNER FLAT
WEIGHT:	.032" — 51.9 POUNDS PER 100 SQUARE FEET .040" — 64.8 POUNDS PER 100 SQUARE FEET
FINISH:	STUCCO EMBOSSED EMBOSSED WITH ALUMALURE FINISH

### Industrial Roofing and Siding, V-Beam

THICKNESS:	.040" AND .050"
LENGTHS:	3' THRU 30' IN INCREMENTS OF 6 INCHES
WIDTHS:	41 $\frac{5}{8}$ " OVER-ALL (39" COVERAGE WITH 1-V SIDE LAP)
V CORRUGATION:	1 $\frac{3}{4}$ " DEEP, 4 $\frac{7}{8}$ " PITCH, $\frac{3}{4}$ " EACH ON TOP AND BOTTOM FLAT
WEIGHT:	.040" — 72.2 POUNDS PER 100 SQUARE FEET .050" — 90.3 POUNDS PER 100 SQUARE FEET
FINISH:	STUCCO EMBOSSED EMBOSSED WITH ALUMALURE FINISH

### Perforated Corrugated Sheet

THICKNESS:	.024"
LENGTHS:	3' THRU 24' IN INCREMENTS OF 6 INCHES
WIDTHS:	33 $\frac{3}{4}$ " OVER-ALL (32" COVERAGE WITH 1 CORRUGATION SIDE LAP)
PERFORATIONS:	$\frac{1}{8}$ " DIAMETER ON $2\frac{1}{64}$ " STAGGERED CENTERS, APPROXIMATELY 14% OF SURFACE OPEN
CORRUGATION:	2.67" PITCH X $\frac{7}{8}$ " DEPTH
FINISH:	STUCCO EMBOSSED EMBOSSED WITH ALUMALURE FINISH
WEIGHT:	APPROXIMATELY 37.3 POUNDS PER 100 SQUARE FEET

ALUMINUM

YOU  
SERV  
YOU  
META

NEW Y  
Worth  
P. O. Bo

CARTE  
P. O. Bo  
Milik St  
Yorktov  
Dir. Dis  
TWX-20

HARRI  
1000 Sou  
Humbol  
Dir. Dis  
TWX-20

CAMBR  
281 Alba  
TRowbr  
Dir. Dist  
TWX-61

PHILAD  
1955 W.  
Baldwin  
Dir. Dist  
TWX-21



# ALUMINUM

## INDUSTRIAL ROOFING ACCESSORIES

Description	Size (inches)
CLOSURE STRIP FOR CORRUGATED.....	.032 x 3 x 32
CLOSURE STRIP FOR V-BEAM.....	.040 x 4 <sup>11</sup> / <sub>16</sub> x 39
CLOSURE STRIP FOR 4" AND 8" RIBBED INDUSTRIAL SIDING.....	.032 x 3 <sup>15</sup> / <sub>16</sub> x 40
ROLL FLASHING (ANNEALED TEMPER).....	.032 x 20 <sup>5</sup> / <sub>8</sub> x 600
FLAT FLASHING SHEET.....	.032 x 36 x 96
FLAT FLASHING SHEET.....	.032 x 48 x 120
FLAT FLASHING SHEET.....	.040 x 36 x 96
FLAT FLASHING SHEET.....	.040 x 48 x 120
FLAT FLASHING SHEET.....	.050 x 36 x 96
FLAT FLASHING SHEET.....	.050 x 48 x 120
PLAIN RIDGE ROLL.....	.032 x 20 <sup>5</sup> / <sub>8</sub> x 96
CORRUGATED SIDE WALL FLASHING.....	.032 x 13 <sup>3</sup> / <sub>4</sub> x 96
CORRUGATED END WALL FLASHING.....	.032 x 13 <sup>3</sup> / <sub>4</sub> x 42
COLOR CAPS (WITH STAINLESS STEEL INSERTS).....	<sup>5</sup> / <sub>8</sub> O.D.
SLOTTED HEAD (TYPE A) SHEET METAL SCREW ALLOY 2024-T4.....	#12 x <sup>3</sup> / <sub>4</sub>
STAINLESS STEEL SELF-TAPPING SCREWS (ALLOY 305 CADMIUM PLATED) WITH RECESSED HEX HEADS WITH A COM- POSITE ALUMINUM AND NEOPRENE WASHER ATTACHED	<div> <div>#14 x 1</div> <div>#14 x 1<sup>3</sup>/<sub>4</sub></div> <div>#14 x 3</div> </div>

### 1100-O COILED WIRE

Commercial Finish

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
.051	.0023	.091	.0076	<sup>1</sup> / <sub>8</sub>	.0145
.064	.0038	<sup>3</sup> / <sub>32</sub>	.0081	<sup>3</sup> / <sub>16</sub>	.0324
.081	.0060	.102	.0096	<sup>1</sup> / <sub>4</sub>	.0577

### 4043-O COILED WELDING WIRE (Formerly "5% Silicon")

Commercial Finish

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
<sup>1</sup> / <sub>16</sub>	.0036	<sup>5</sup> / <sub>32</sub>	.0223
<sup>3</sup> / <sub>32</sub>	.0080	<sup>3</sup> / <sub>16</sub>	.0322
<sup>1</sup> / <sub>8</sub>	.0144	<sup>1</sup> / <sub>4</sub>	.0573

STAINLESS STEEL

WIRE • ROD • BAR

TUBING • PIPE

BRASS

STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

WEIGHTS

FOUNDRY • WELDING  
BRAZING PRODUCTS

# ALUMINUM

## 4043-H18 COILED WELDING WIRE

Commercial Finish

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{16}$ (H19)	.0036	$\frac{5}{32}$	.0223
.091	.0075	$\frac{3}{16}$	.0322
$\frac{3}{32}$	.0080	$\frac{1}{4}$ (H16) TEMPER)	.0573
$\frac{1}{8}$	.0144		

## 1100-H19 COILED WIRE

Diameter (in inches)	Pounds per Lineal Foot
.091	.0076
$\frac{1}{8}$	.0145
$\frac{3}{16}$ (H18)	.0324

## 1100 ROUND DRAWN STRAIGHT WIRE

Standard 12 Foot Lengths

(temper after diameter)

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$ (H19)	.0145	$\frac{3}{16}$ (H18)	.0324	$\frac{5}{16}$ (H14)	.0901
$\frac{5}{32}$ (H18)	.0225	$\frac{1}{4}$ (H16)	.0577		

## 1100-H14 RIVET WIRE COILED

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
.061	.0035	.123	.0143	.184	.0314
.092	.0078	.154	.0223	.247	.0560
.118	.0129	.162	.0242		

ALUMINUM

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CARTE  
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Milik St  
Yorktow  
Dir. Dist  
TWX-20

HARRIS  
1000 Sou  
HUMBOL  
Dir. Dist  
TWX-20

CAMBR  
281 Alba  
TRowbr  
Dir. Dist  
TWX-61

PHILAD  
1955 W.  
Baldwin  
Dir. Dist  
TWX-21



# ALUMINUM

## 2017-H13 AND 2117-H15 RIVET WIRE — COILED

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
.092	.0078	.154	.0023	.247	.0560
.123	.0143	.184	.0314		

## 2017-T4 COILED WIRE

Diameter (in inches)	Pounds per Lineal Foot
.116	.0129
.172	.0272



## 1100-F ROUND ROD

Standard 12 Foot Lengths



Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
COLD FINISHED		COLD FINISHED		ROLLED	
3/8	.1297	1	.9227	2	3.6908
7/16	.1766	1 1/4	1.4417	*2 1/4	4.6711
1/2	.2306	1 3/8	1.7445	*2 1/2	5.7667
9/16	.2919	1 1/2	2.076	*3	8.3042
5/8	.3604	ROLLED		†3 1/2	11.3029
3/4	.5190	1 3/4	2.8257	†4	14.7630
7/8	.7064	1 7/8	3.2437		

\*Random 6 to 12 foot Lengths.

†Random 3 to 12 foot Lengths.

STAINLESS STEEL

ROD • SHAPES • WIRE

INDUSTRIAL PRODUCTS

MONEL-NICKEL

WEIGHTS

BRASS

TUBING • PIPE

STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

COPPER

FOUNDRY • WELDING  
BRAZING PRODUCTS

## ALUMINUM



## 2011-T3 ROUND ROD



Standard Screw Machine Stock \*  
Standard 12 Foot Lengths

Diameter (in Inches)	Pounds per Lineal Foot	Diameter (in Inches)	Pounds per Lineal Foot	Diameter (in Inches)	Pounds per Lineal Foot
DRAWN		COLD FINISHED		ROLLED	
1/8	.0149	19/32	.338	19/16	2.34
5/32	.0233	5/8	.375	1 5/8	2.53
3/16	.0336	21/32	.414	1 11/16	2.74
7/32	.0459	11/16	.454	1 3/4	2.95
15/64	.0525	3/4	.540	1 13/16	3.15
1/4	.0600	13/16	.633	1 7/8	3.37
17/64	.0679	7/8	.735	1 15/16	3.59
9/32	.0756	15/16	.845	2	3.84
5/16	.094	1	.960	2 1/8	4.34
11/32	.113	1 1/16	1.08	2 1/4	4.86
COLD FINISHED		1 1/8	1.22	2 3/8	5.41
3/8	.135	1 3/16	1.35	2 1/2	6.00
25/64	.147	1 1/4	1.49	2 9/16	6.30
13/32	.159	1 5/16	1.66	2 3/4	7.26
7/16	.184	1 3/8	1.81	2 7/8	7.93
15/32	.210	1 7/16	2.00	3	8.64
1/2	.240	1 1/2	2.16		
17/32	.271				
35/64	.290				
9/16	.305				

\*All above items may be obtained in 2011-T8.

†Random 6 to 12 foot Lengths.

YOU  
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YOUR  
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Worth  
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CARTE  
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Milik St  
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TWX-20

HARRI  
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Humbol  
Dir. Dis  
TWX-20

CAMBR  
281 Alba  
TRowbr  
Dir. Dist  
TWX-61

PHILAD  
1955 W.  
Baldwin  
Dir. Dist  
TWX-21



# ALUMINUM



## 2017-T4 AND 2017-T451 ROUND ROD

(Temper designation listed)

Standard Screw Machine Stock †  
Standard 12 Foot Lengths

Diameter (in inches)			Pounds per Lineal Foot	Diameter (in inches)			Pounds per Lineal Foot	Diameter (in inches)			Pounds per Lineal Foot
DRAWN				COLD FINISHED				ROLLED			
3/32	T4	.0083		25/32	T451	.580		*2 1/4	T451		4.81
1/8	"	.0147		13/16	"	.627		*2 5/16	"		5.08
5/32	"	.023		7/8	"	.727		*2 3/8	"		5.36
11/64	"	.028		15/16	"	.837		*2 7/16	"		5.64
3/16	"	.033		1	"	.956		*2 1/2	"		5.94
7/32	"	.045		1 1/16	"	1.07		*2 9/16	"		6.24
15/64	"	.054		1 1/8	"	1.21		*2 5/8	"		6.55
1/4	"	.059		1 3/16	"	1.34		*2 3/4	"		7.19
17/64	"	.07		1 1/4	"	1.48		*2 7/8	"		7.86
9/32	"	.075		1 5/16	"	1.64		*3	"		8.55
5/16	"	.093		1 3/8	"	1.79		*3 1/8	"		9.28
COLD FINISHED				1 7/16	"	1.98		*3 1/4	"		10.04
3/8	T4	.134		1 1/2	"	2.14		*3 3/8	"		10.83
13/32	"	.157		ROLLED				‡3 1/2	"		11.64
7/16	"	.182		1 9/16	T451	2.32		‡3 3/4	"		13.36
15/32	"	.208		1 5/8	"	2.51		‡4	"		15.21
1/2	T451	.238		1 11/16	"	2.71		4 1/8	"		16.34
17/32	"	.268		1 3/4	"	2.92		‡4 1/4	"		17.17
9/16	"	.302		1 13/16	"	3.12		‡4 1/2	"		19.24
19/32	"	.335		1 7/8	"	3.34		‡4 3/4	"		21.44
5/8	"	.371		1 15/16	"	3.56		‡5	"		23.76
21/32	"	.426		2	"	3.80		‡5 1/2	"		28.84
11/16	"	.449		*2 1/16	"	4.05		‡6	"		34.21
23/32	"	.491		*2 1/8	"	4.30		‡7	T4		46.57
3/4	"	.535		*2 3/16	"	4.55		‡8	"		60.82

†Screw Machine Stock includes Sizes 1/8" to 3 3/8" inclusive.  
Other Sizes are Regular Rod.

\*Random 6 to 12 foot Lengths.

‡Random 3 to 12 foot Lengths.

STAINLESS STEEL

TUBING • PIPE

STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

BRASS

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

## ALUMINUM


**2024-T4 AND 2024-T351  
ROUND WIRE AND ROD**

(Temper designation listed)

Diameter (in inches)	Pounds per Lineal Foot
-------------------------	---------------------------

## DRAWN

1/8	T4	.014
3/16	"	.033
1/4	"	.059
5/16	"	.092

## COLD FINISHED

3/8	T4	.132
7/16	"	.180
1/2	T351	.235
9/16	"	.297
5/8	"	.367
11/16	"	.444
3/4	"	.528
13/16	"	.620
7/8	"	.719
15/16	"	.825
1	"	.939
1 1/16	"	1.060
1 1/8	"	1.188
1 1/4	"	1.468
1 5/16	"	1.618
1 3/8	"	1.776
1 7/16	"	1.941
1 1/2	"	2.113

## ROLLED

1 9/16	T351	2.293
1 5/8	"	2.480
1 3/4	"	2.876


**Standard Screw Machine Stock†  
Standard 12 Foot Lengths**

Diameter (in inches)	Pounds per Lineal Foot
-------------------------	---------------------------

## ROLLED

1 1/8	T351	3.302
2	"	3.757
*2 1/8	"	4.241
*2 1/4	"	4.755
*2 3/8	"	5.298
*2 1/2	"	5.870
*2 5/8	"	6.472
*2 3/4	"	7.103
*2 7/8	"	7.763
*3	"	8.453
*3 1/8	"	9.191
*3 1/4	"	9.941
*3 3/8	"	10.72
†3 1/2	"	11.53
†3 3/4	"	13.23
†4	"	15.06
†4 1/4	"	17.00
†4 1/2	"	19.06
†4 3/4	"	21.19
†5	"	23.46
†5 1/4	"	25.89
†5 1/2	"	28.56
6	"	33.88
6 1/2	T4	39.76

 †Screw Machine Stock includes sizes  
1/8" to 3 3/8" inclusive.  
Other Sizes are Regular Rod.

 \*Random 6 to 12 foot lengths.  
†Random 3 to 12 foot lengths.

 YOU  
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YOU  
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 NEW Y  
Worth  
P. O. B

 CARTE  
P. O. B  
Milik St  
YOrkto  
Dir. Dis  
TWX-20

 HARRI  
1000 So  
HUmbo  
Dir. Dis  
TWX-20

 CAMBF  
281 Alb  
TRowbr  
Dir. Dis  
TWX-61

 PHILAD  
1955 W.  
BALDWIN  
Dir. Dist  
TWX-21



# ALUMINUM



## 6061-T6 AND 6061-T651 ROUND WIRE AND ROD

(Temper designation listed)

Diameter (in inches)		Pounds per Lineal Foot
<b>DRAWN</b>		
1/8	T6	.014
3/16	"	.032
1/4	"	.058
5/16	"	.090
<b>COLD FINISHED</b>		
3/8	T6	.130
7/16	"	.177
1/2	T651	.231
9/16	"	.291
5/8	"	.360
3/4	"	.519
13/16	"	.609
7/8	"	.706
15/16	"	.811
1	"	.923
1 1/16	"	1.041
1 1/8	"	1.17
1 3/16	"	1.301
1 1/4	"	1.44
1 5/16	"	1.59
1 3/8	"	1.74
1 1/2	"	2.08
<b>ROLLED</b>		
1 5/8	T651	2.44
1 11/16	"	2.627
1 3/4	"	2.82
1 13/16	"	3.031
1 7/8	"	3.24

‡Screw Machine Stock includes sizes  
1/8" to 3 3/8" inclusive.  
Other Sizes are Regular Rod,



Standard Screw Machine Stock‡

Standard 12 Foot Lengths

Diameter (in inches)		Pounds per Lineal Foot
1 15/16	"	3.463
2	"	3.69
2 1/16	"	3.925
*2 1/8	"	4.17
2 3/16	"	4.415
*2 1/4	"	4.67
2 3/8	"	5.204
2 1/2	"	5.77
2 5/8	"	6.357
2 11/16	"	6.642
2 3/4	"	6.98
2 13/16	"	7.298
2 7/8	"	7.626
*3	"	8.30
3 1/8	"	9.010
3 1/4	"	9.74
3 3/8	"	10.510
†3 1/2	"	11.30
†3 3/4	"	12.98
†4	"	14.76
†4 1/2	"	18.68
†5	"	23.07
†5 1/2	"	28.00
†6	"	33.22
†6 1/2	"	38.98
†7	"	45.21

\*Random 6 to 12 foot lengths.

†Random 3 to 12 foot lengths.

STAINLESS STEEL

SHEET • PLATE

ROD • SHAPES • WIRE

TUBING • PIPE

BRASS

STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

COPPER

MONEL-NICKEL

WEIGHTS

FOUNDRY • WELDING  
BRAZING PRODUCTS

# ALUMINUM

## 2014-F ROUND FORGING BAR

### CLASS I

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
1	.923	2 $\frac{1}{4}$	4.671
1 $\frac{1}{4}$	1.442	2 $\frac{1}{2}$	5.767
1 $\frac{1}{2}$	2.076	2 $\frac{5}{8}$	6.358
1 $\frac{3}{4}$	2.826	3 $\frac{1}{4}$	9.746
2	3.691	4 $\frac{1}{2}$	18.684

## 6061-F ROUND FORGING BAR

### CLASS I

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
2 $\frac{1}{4}$	4.671	5	23.067
2 $\frac{1}{2}$	5.767	6	33.216
4 $\frac{1}{2}$	18.684		

## 7075-F ROUND FORGING BAR

### CLASS I

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
2	3.691	3	8.304
2 $\frac{1}{2}$	5.767	4 $\frac{1}{2}$	18.684

ALUMINUM

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YOUR  
METAL

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P. O. Bo

CARTER  
P. O. Bo  
Milik Str  
YOrktow  
Dir. Dist  
TWX-20

HARRIS  
1000 Sou  
HUmbole  
Dir. Dist  
TWX-20

CAMBR  
281 Albar  
TRowbr  
Dir. Dist  
TWX-61

PHILAD  
1955 W. 1  
Baldwin  
Dir. Dist  
TWX-21



# ALUMINUM



## 6063-T5 EXTRUDED ROUND ROD



16 Foot Lengths

Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{2}$	.235
$\frac{5}{8}$	.368
$\frac{3}{4}$	.530
1	.942



## 6262-T9 ROUND WIRE AND ROD



Standard Screw Machine Stock  
Standard 12 Foot Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
DRAWN		ROLLED	
$\frac{1}{4}$	.058	$1\frac{3}{4}$	2.83
COLD FINISHED		2	3.69
$\frac{3}{8}$	.130	$2\frac{1}{4}$	4.67
$\frac{1}{2}$	.230	$2\frac{1}{2}$	5.76
$\frac{5}{8}$	.360	$2\frac{3}{4}$	6.97
$\frac{3}{4}$	.518	3	8.29
$\frac{7}{8}$	.706		
1	.922		
$1\frac{1}{4}$	1.43		
$1\frac{1}{2}$	2.07		

STAINLESS STEEL

SHEET • PLATE

ROD • SHAPES • WIRE

INDUSTRIAL PRODUCTS

TUBING • PIPE

BRASS

MONEL-NICKEL

WEIGHTS

STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

COPPER

FOUNDRY • WELDING  
BRAZING PRODUCTS

# ALUMINUM



## 7075-T6 AND 7075-T651 ROUND ROD

(Temper designation listed)

Standard 12 Foot Lengths

Diameter (in inches)	Pounds per Lineal Foot
-------------------------	---------------------------

### COLD FINISHED

$\frac{3}{8}$	T6	.133
$\frac{1}{2}$	T651	.237
$\frac{3}{4}$	"	.534
1	"	.930
$1\frac{1}{8}$	"	1.20
$1\frac{1}{4}$	"	1.484
$1\frac{3}{8}$	"	1.796
$1\frac{1}{2}$	"	2.14
$1\frac{5}{8}$	"	2.509

### ROLLED

$1\frac{3}{4}$	T651	2.91
2	"	3.80
$2\frac{1}{4}$	"	4.811
$2\frac{1}{2}$	"	5.94
$2\frac{3}{4}$	"	7.19
3	"	8.55
$3\frac{1}{2}$	"	11.64
4	"	15.21



## 2011-T3 HEXAGONAL BAR

Standard Screw Machine Stock  
Standard 12 Foot Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{4}$	COLD FINISHED .066	$1\frac{3}{16}$	COLD FINISHED .699
$\frac{5}{16}$	" .104	$\frac{7}{8}$	" .810
$1\frac{1}{32}$	" .125	$1\frac{5}{16}$	" .929
$\frac{3}{8}$	" .148	1	" 1.06
$\frac{7}{16}$	" .203	$1\frac{1}{16}$	" 1.192
$\frac{1}{2}$	" .265	$1\frac{1}{8}$	" 1.34
$\frac{9}{16}$	" .335	$1\frac{1}{4}$	" 1.66
$\frac{5}{8}$	" .413	$1\frac{3}{8}$	" 2.00
$1\frac{1}{16}$	" .500	$1\frac{1}{2}$	" 2.38
$\frac{3}{4}$	" .595	$1\frac{3}{4}$	" 3.254
		2	" 4.236

YOU  
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YOUR  
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CARTE  
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Milik St  
YOrktov  
Dir. Dist  
TWX-20

HARRIS  
1000 Sou  
Humbol  
Dir. Dist  
TWX-20

CAMBR  
281 Alba  
TRowbr  
Dir. Dist  
TWX-61

PHILAD  
1955 W.  
Baldwin  
Dir. Dist  
TWX-21

# ALUMINUM



## 2017-T4 AND 2017-T451 HEXAGONAL BAR

(Temper designation listed)

Size (in inches)		Pounds per Lineal Foot
<b>DRAWN</b>		
3/16	T4	.037
1/4	"	.065
5/16	"	.102
<b>COLD FINISHED</b>		
3/8	T4	.147
7/16	"	.201
1/2	T451	.262
9/16	"	.332
5/8	"	.409
11/16	"	.495
3/4	"	.589
13/16	"	.692
7/8	"	.802
15/16	"	.920
1	"	1.05
1 1/16	"	1.18



## Standard Screw Machine Stock Standard 12 Foot Lengths

Size (in inches)		Pounds per Lineal Foot
<b>COLD FINISHED</b>		
1 1/8	T451	1.33
1 3/16	"	1.47
1 1/4	"	1.64
1 5/16	"	1.80
1 3/8	"	1.98
1 7/16	"	2.16
1 1/2	"	2.36
<b>ROLLED</b>		
1 5/8	T451	2.77
1 3/4	"	3.21
1 7/8	"	3.69
2	"	4.19
2 3/16	"	5.21
*2 1/4	"	5.31
*2 1/2	"	6.55
*2 3/4	"	7.92
*3	"	9.43

\*Random 6 to 12 foot lengths.

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# ALUMINUM



## 2024-T4 AND 2024-T351 HEXAGONAL WIRE AND BAR

(Temper designation listed)

Size (In inches)		Pounds per Lineal Foot
COLD FINISHED		
3/16	T4	.036
1/4	"	.064
5/16	"	.101
3/8	"	.146
7/16	"	.199
1/2	T351	.259
9/16	"	.328
5/8	"	.405
11/16	"	.491
3/4	"	.584
7/8	"	.794
1	"	1.04



## Standard 12 Foot Lengths

Size (In inches)		Pounds per Lineal Foot
COLD FINISHED		
1 1/8	T351	1.31
1 1/4	"	1.62
1 3/8	"	1.96
1 1/2	"	2.33
ROLLED		
1 5/8	T351	2.74
1 3/4	"	3.18
1 7/8	"	3.65
2	"	4.15
*2 1/4	"	5.25
*2 1/2	"	6.48
*2 3/4	"	7.85
*3	"	9.34

\*Random 6 to 12 foot lengths.

## 6061-T651 HEXAGONAL BAR

## Standard 12 Foot Lengths

Size (In inches)	Pounds per Lineal Foot	Size (In inches)	Pounds per Lineal Foot
3/4	.572	1 11/16	2.897
7/8	.778	1 13/16	3.342
1	1.016	1 7/8	3.576
1 1/16	1.147	2	4.069
1 5/16	1.750	2 1/8	4.594
1 3/8	1.921	2 3/8	5.967
1 1/2	2.286	2 5/8	7.010
1 5/8	2.686		

ALUMINUM

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TRowbr  
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TWX-61

PHILAD  
1955 W. I  
BALdwin  
Dir. Dist  
TWX-21

# ALUMINUM

## 6063-T5 EXTRUDED HEXAGONAL BAR

16 Foot lengths

Size (in inches)	Pounds per Lineal Foot
$\frac{1}{2}$	.259
$\frac{3}{4}$	.586
1	1.039
$1\frac{1}{2}$	2.237

## 6262-T9 HEXAGONAL BAR

Standard Screw Machine Stock  
Standard 12 Foot Lengths

Size (in inches)	Pounds per Lineal Foot
---------------------	---------------------------

$\frac{3}{4}$  COLD FINISHED .571

## 1100-H14 SQUARE WIRE

Standard 12 Foot Lengths

Size (in inches)		Pounds per Lineal Foot
$\frac{3}{16}$	DRAWN	.0413
$\frac{1}{4}$	"	.0734
$\frac{5}{16}$	"	.1148
$\frac{3}{8}$	COLD FINISHED	.1652
*F Temper		

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WEIGHTS  
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# ALUMINUM



## 2017-T4 AND 2017-T451 SQUARE BAR

(Temper designation listed)

Size (in inches)		Pounds per Lineal Foot
COLD FINISHED		
$\frac{3}{8}$	T4	.170
$\frac{7}{16}$	"	.231
$\frac{1}{2}$	T451	.302
$\frac{5}{8}$	"	.472
$\frac{3}{4}$	"	.679
$1\frac{1}{16}$		.798



## Standard 12 Foot Lengths

Size (in inches)		Pounds per Lineal Foot
COLD FINISHED		
$\frac{7}{8}$	T451	.925
1	"	1.21
$1\frac{1}{4}$	"	1.89
$1\frac{1}{2}$	"	2.62
ROLLED		
2	T451	4.83



## 2024-T4 AND 2024-T351 SQUARE BAR

(Temper designation listed)

Size (in inches)		Pounds per Lineal Foot
COLD FINISHED		
$\frac{5}{16}$	T4	.120
$\frac{3}{8}$	"	.168
$\frac{7}{16}$	"	.229
$\frac{1}{2}$	T351	.299
$\frac{9}{16}$	"	.378
$\frac{5}{8}$	"	.467
$\frac{3}{4}$	"	.672
$\frac{7}{8}$	"	.916
1	"	1.19
$1\frac{1}{8}$	"	1.51
$1\frac{1}{4}$	"	1.87
$1\frac{1}{2}$	"	2.69



## Standard 12 Foot Lengths

Size (in inches)		Pounds per Lineal Foot
ROLLED		
$1\frac{3}{4}$	T351	3.66
2	"	4.78
EXTRUDED		
$2\frac{1}{4}$	T351	6.076
$2\frac{1}{2}$	"	7.500
$2\frac{3}{4}$	"	9.076
3	"	10.800
ROLLED		
$*3\frac{3}{4}$	T351	12.6
$\dagger 3\frac{1}{2}$	"	14.6
$\dagger 4$	"	19.2

\*Random 6 to 12 foot lengths.  
 †Random 3 to 12 foot lengths.

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TRowbr  
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1955 W.  
Baldwin  
Dir. Dist  
TWX-21



# ALUMINUM



## 6061-T651 EXTRUDED SQUARE BAR

Standard 12 Foot Lengths

Size (in inches)	Pounds per Lineal Foot
2	4.80
*3 1/4	12.676

\*Random 6 to 12 foot lengths.



## 6063-T5 EXTRUDED SQUARE BAR

Sharp Corners, 16 Foot Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
1/4	.075	5/8	.459	1 1/4	1.83
5/16	.116	3/4	.661	1 1/2	2.64
3/8	.168	1	1.17		
1/2	.294				



## 7075-T651 SQUARE BAR

Standard 12 Foot Lengths

Size (in inches)		Pounds per Lineal Foot
1	COLD FINISHED	1.21
1 1/2	" "	2.72
1 3/4	" "	3.70
2	ROLLED	4.80

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# ALUMINUM

## 2024-T4 AND 2024-T351 RECTANGULAR BAR

(Temper designation listed)

Size (in inches)	Pounds per Lineal Foot
<b>COLD FINISHED</b>	
$\frac{1}{8}$ X $\frac{1}{2}$ T4	.075
$\frac{1}{8}$ X $\frac{5}{8}$ "	.094
$\frac{3}{4}$ "	.112
1 "	.150
$1\frac{1}{4}$ "	.187
$1\frac{1}{2}$ "	.225
2 "	.300
$\frac{3}{16}$ X $\frac{1}{2}$ "	.112
$\frac{5}{8}$ "	.140
$\frac{3}{4}$ "	.168
1 "	.225
$1\frac{1}{4}$ "	.281
$1\frac{1}{2}$ "	.337
2 "	.449
$\frac{1}{4}$ X $\frac{1}{2}$ "	.150
$\frac{5}{8}$ "	.187
$\frac{3}{4}$ "	.225
$\frac{7}{8}$ "	.262
1 "	.300
$1\frac{1}{4}$ "	.374
$1\frac{1}{2}$ "	.449
2 "	.599
$2\frac{1}{2}$ "	.749
3 "	.899
<b>ROLLED</b>	
$\frac{1}{4}$ X 4 T4	1.198
<b>COLD FINISHED</b>	
$\frac{5}{16}$ X $\frac{1}{2}$ T4	.187
$\frac{5}{8}$ "	.234
$\frac{3}{4}$ "	.281
1 "	.374
$1\frac{1}{2}$ "	.562
2 "	.749
$\frac{3}{8}$ X $\frac{1}{2}$ "	.225
$\frac{5}{8}$ "	.281
$\frac{3}{4}$ "	.337
1 "	.449
$1\frac{1}{4}$ "	.562
$1\frac{1}{2}$ "	.674
$1\frac{3}{4}$ "	.786
2 "	.899
$2\frac{1}{2}$ "	1.123
3 "	1.348
<b>ROLLED</b>	
$\frac{3}{8}$ X 4 T4	
6 "	2.696
*10 T4	4.494
<b>COLD FINISHED</b>	
$\frac{1}{2}$ X $\frac{5}{8}$ T351	.374

## Square Edge

Standard 12 Foot Lengths

Size (in inches)	Pounds per Lineal Foot
$\frac{3}{4}$ "	.449
$\frac{7}{8}$ "	.524
1 "	.599
$1\frac{1}{4}$ "	.749
$1\frac{1}{2}$ "	.899
$1\frac{3}{4}$ "	1.048
2 "	1.198
$2\frac{1}{2}$ "	1.498
3 "	1.797
<b>ROLLED</b>	
$\frac{1}{2}$ X 4 T351	2.377
6 "	3.595
* 8 "	4.793
*10 "	5.991
<b>COLD FINISHED</b>	
$\frac{5}{8}$ X $\frac{3}{4}$ T351	.562
$\frac{7}{8}$ "	.655
1 "	.749
$1\frac{1}{4}$ "	.936
$1\frac{1}{2}$ "	1.123
2 "	1.498
$\frac{3}{4}$ X 1 "	.899
$1\frac{1}{2}$ "	1.348
2 "	1.797
$2\frac{1}{2}$ "	2.247
3 "	2.696
<b>ROLLED</b>	
$\frac{3}{4}$ X $3\frac{1}{2}$ T351	3.146
* 6 "	5.392
<b>COLD FINISHED</b>	
1 X $1\frac{1}{4}$ T351	1.498
$1\frac{1}{2}$ "	1.797
$1\frac{3}{4}$ "	2.097
2 "	2.397
$2\frac{1}{2}$ "	2.996
3 "	3.595
<b>ROLLED</b>	
1 X * $3\frac{1}{2}$ T351	4.194
* 4 "	4.793
* 6 "	7.190
<b>COLD FINISHED</b>	
$1\frac{1}{4}$ X $1\frac{1}{2}$ T351	2.247
2 "	2.996
$2\frac{1}{2}$ "	3.745
<b>ROLLED</b>	
$1\frac{1}{4}$ X $\frac{1}{2}$ 3 T351	4.494
<b>COLD FINISHED</b>	
$1\frac{1}{2}$ X 2 T351	3.595

Continued on next page.

\*3 to 12 foot lengths.

†6 to 12 foot lengths.

# ALUMINUM

## 2024-T4 AND 2024-T351 RECTANGULAR BAR (Continued)

(Temper designation listed)

Size (in inches)		Pounds per Lineal Foot
ROLLED		
1 1/2 X 1/2	T351	4.494
1 1/2 X 1	"	5.392
1 1/2 X 3/4	"	7.190
1 1/2 X 1/2	"	10.78
1 1/2 X 1/4	"	14.38
2 X 1 1/2	"	5.398
2 X 1	"	5.991
2 X 3/4	"	7.190
2 X 1/2	"	8.387
2 X 1/4	"	9.586

## Square Edge Standard 12 Foot Lengths

Size (in inches)		Pounds per Lineal Foot
ROLLED		
2 X 1/2	T351	14.38
2 X 1	"	10.78
2 X 3/4	"	11.98
2 X 1/2	"	13.48
2 X 1/4	"	14.98
2 X 1/2	"	17.97
2 X 3/4	"	13.18
3 X 1/2	"	14.38
3 X 1	"	21.57

\*3 to 12 foot lengths.  
†6 to 12 foot lengths.

## 6061-T6 AND 6061-T651 EXTRUDED RECTANGULAR BAR

(Temper designation listed)

Size (in inches)		Pounds per Lineal Foot
1/8 X 1	T6	.150
1/8 X 1/2	"	.300
3/16 X 3/4	"	.169
1/4 X 1	"	.226
1/4 X 1/2	"	.338
1/4 X 1	"	.451
1/4 X 1/4	"	.300
1/4 X 1/2	"	.376
1/4 X 1	"	.450
1/4 X 1/2	"	.600
1/4 X 1	"	.900
3/8 X 1/2	"	.225
3/8 X 3/4	"	.337
1/2 X 1	"	.450
1/2 X 1/4	"	.564
1/2 X 1/2	"	.900
1/2 X 1	"	1.350

## Square Edge Standard 12 Foot Lengths

Size (in inches)		Pounds per Lineal Foot
3/8 X 1/2	T6	1.800
3/8 X 1/4	"	2.700
1/2 X 3/4	T651	.441
1/2 X 1	"	.600
1/2 X 1/2	"	1.200
1/2 X 1/4	"	1.500
1/2 X 1/2	"	1.800
1/2 X 1	"	2.400
1/2 X 1/2	"	3.600
3/4 X 1	"	.900
1 X 1/2	"	1.800
1 X 1	"	2.700
1 X 1/2	"	2.400
1 X 1	"	4.800
1 1/4 X 1/2	"	3.000
1 1/2 X 1/2	"	4.050
1 1/2 X 1	"	5.400
1 1/2 X 1/2	"	10.800



**YOU  
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Dir. Dist  
TWX-61

**PHILAD**  
1955 W.  
Baldwin  
Dir. Dist  
TWX-21

# ALUMINUM

## 7075-T6 AND 7075-T651 RECTANGULAR BAR

(Temper designation listed)

Size (in inches)	Pounds per Lineal Foot
<b>COLD FINISHED</b>	
$\frac{1}{4} \times 1$ T6	.302
$1\frac{1}{2}$ "	.454
3 "	.905
$\frac{3}{8} \times 1$ "	.454
$\frac{1}{2} \times 1\frac{1}{2}$ T651	.907
4 "	2.420
$\frac{5}{8} \times 1$ "	.756
$\frac{3}{4} \times 3$ "	2.723
1 X $1\frac{3}{4}$ "	2.117
2 "	2.420
<b>ROLLED</b>	
3 T651	3.630
*4 "	4.840

## Square Edge

Standard 12 Foot Lengths

Size (in inches)	Pounds per Lineal Foot
<b>ROLLED</b>	
$1\frac{1}{4} \times \dagger 3$ T651	4.538
$1\frac{1}{2} \times \dagger 2\frac{1}{2}$ "	4.538
"*4 "	7.260
2 X $\dagger 2\frac{1}{2}$ "	6.050
$\dagger 3$ "	7.260
*4 "	9.680
*6 "	14.52
$2\frac{1}{2} \times *4$ "	12.10
*6 "	18.15
3 X *4 "	14.52
*4 $\frac{1}{2}$ "	16.33
*6 "	21.78

\*3 to 12 foot lengths  
 $\dagger 6$  to 12 foot lengths

## 6063-T5 EXTRUDED RECTANGULAR BAR

Sharp Corners, 16 Foot Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{8} \times \frac{1}{2}$	.075	$\frac{1}{4} \times \frac{1}{2}$	.15	$\frac{3}{8} \times 1\frac{1}{2}$	.675
$\frac{5}{8}$	.094	$\frac{5}{8}$	.187	2	.900
$\frac{3}{4}$	.113	$\frac{3}{4}$	.225	3	1.35
1	.150	1	.300	$\frac{1}{2} \times \frac{3}{4}$	.45
$1\frac{1}{4}$	.187	$1\frac{1}{4}$	.375	1	.600
$1\frac{1}{2}$	.226	$1\frac{1}{2}$	.45	$1\frac{1}{4}$	.75
$1\frac{3}{4}$	.263	$1\frac{3}{4}$	.525	$1\frac{1}{2}$	.900
2	.300	2	.600	2	1.200
$\frac{3}{16} \times \frac{1}{2}$	.113	$2\frac{1}{2}$	.750	$2\frac{1}{2}$	1.500
$\frac{3}{4}$	.169	3	.900	3	1.800
1	.226	$\frac{3}{8} \times \frac{1}{2}$	.224	$\frac{3}{4} \times 1\frac{1}{2}$	1.35
$1\frac{1}{4}$	.282	$\frac{5}{8}$	.281	2	1.800
$1\frac{1}{2}$	.338	$\frac{3}{4}$	.338	3	2.700
2	.451	1	.45	1 X $1\frac{1}{2}$	1.800
$2\frac{1}{2}$	.564	$1\frac{1}{4}$	.563	2	2.400

# ALUMINUM

## NO. 2 EC-T61 RECTANGULAR BUS BAR

Size (in inches)	Pounds per Lineal Foot
1/4 X 1	.290
1 1/2	.437
2	.584
3	.878

## Extruded 12 or 20 Foot Lengths

Size (in inches)	Pounds per Lineal Foot
1/4 X 4	1.172
6	1.760
3/8 X 2	.880
4	1.760

## 3003-H14 DRAWN TUBE

O.D. (in inches)	Wall		Pounds per Lineal Foot
	B. W. Gauge	Inches	
3/16 X	24	.022	.013
1/4 X	24	.022	.019
	20	.035	.028
3/8 X	24	.022	.029
	22	.028	.036
	20	.035	.044
1/2 X	22	.028	.049
	20	.035	.061
	18	.049	.083
	16	.065	.105
5/8 X	22	.028	.063
	20	.035	.077
	18	.049	.105
	16	.065	.135
3/4 X	20	.035	.093
	18	.049	.128
	17	.058	.149
	16	.065	.166
7/8 X	20	.035	.110
	18	.049	.150
	17	.058	.177
	16	.065	.196

## Round 12 Foot Lengths

O.D. (in inches)	Wall		Pounds per Lineal Foot
	B. W. Gauge	Inches	
1 X	20	.035	.126
	18	.049	.174
	17	.058	.204
	16	.065	.226
1 1/8 X	17	.058	.230
1 1/4 X	20	.035	.159
	18	.049	.219
	17	.058	.258
1 3/8 X	17	.058	.285
1 1/2 X	20	.035	.191
	18	.049	.266
	17	.058	.312
	16	.065	.347
1 3/4 X	20	.035	.224
	18	.049	.311
	16	.065	.404
2 X	20	.035	.257
	18	.049	.357
	16	.065	.469
2 1/2 X	18	.049	.447
	16	.065	.586
3 X	16	.065	.707

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## ALUMINUM

## 3003-H18 DRAWN TUBE

Round

12 Foot Lengths

O.D. (in inches)	Wall		Pounds per Lineal Foot
	B. W. Gauge	Inches	
$\frac{3}{8}$ X 20		.035	.044
$\frac{1}{2}$ X 20		.035	.061
*2 X 21		.032	.235

\*Also available in 16, 18, and  
20 foot lengths.

## 2024-T3 DRAWN TUBE

Round

12 Foot Lengths

O.D. (in inches)	Wall		Pounds per Lineal Foot	O.D. (in inches)	Wall		Pounds per Lineal Foot
	B. W. Gauge	Inches			B. W. Gauge	Inches	
$\frac{3}{16}$ X 20		.035	.020	1 X 18		.049	.175
$\frac{1}{4}$ X 20		.035	.028		16	.065	.228
$\frac{5}{16}$ X 18		.049	.049		13	.095	.324
$\frac{3}{8}$ X 18		.049	.060	$1\frac{1}{8}$ X 16		.065	.260
	17	.058	.069	$1\frac{1}{4}$ X 18		.049	.221
$\frac{1}{2}$ X 20		.035	.061		16	.065	.290
$\frac{5}{8}$ X 20		.035	.077	$1\frac{1}{2}$ X 20		.035	.193
	18	.049	.106		18	.049	.268
	16	.065	.137		16	.065	.351
$\frac{3}{4}$ X 20		.035	.094	2 X 16		.065	.473
	18	.049	.129	$2\frac{1}{2}$ X 16		.065	.592
$\frac{7}{8}$ X 18		.049	.152		11	.120	1.08
1 X 20		.035	.127	3 X 11		.120	1.31

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Dir. Dist  
TWX-20

CAMBRIDGE  
281 Albe  
TRowbr  
Dir. Dist  
TWX-61

PHILADELPHIA  
1955 W.  
Baldwin  
Dir. Dist  
TWX-21



# ALUMINUM

## 5052-O DRAWN TUBE

Round  
12 Foot Lengths

O.D. (in inches)		Wall		Pounds per Lineal Foot
		B. W. Gauge	Inches	
1/8	X	20	.035	.011
3/16	X	20	.035	.019
1/4	X	22	.028	.022
		20	.035	.027
5/16	X	20	.035	.035
3/8	X	20	.035	.043
		18	.049	.058
1/2	X	20	.035	.059
		18	.049	.080
5/8	X	20	.035	.074
		19	.042	.088
		18	.049	.102
3/4	X	20	.035	.090

O.D. (in inches)		Wall		Pounds per Lineal Foot
		B. W. Gauge	Inches	
3/4	X	18	.049	.124
1	X	20	.035	.123
		18	.049	.169
1 1/4	X	20	.035	.154
		18	.049	.213
1 1/2	X	18	.049	.258
1 3/4	X	18	.049	.302
2	X	20	.035	.249
		18	.049	.346
		16	.065	.455
2 1/2	X	20	.035	.315
		18	.049	.434

SHEET • PLATE ROD • SHAPES • WIRE

INDUSTRIAL PRODUCTS

MONEL-NICKEL

WEIGHTS

FOUNDRY • WELDING  
BRAZING PRODUCTS

STAINLESS STEEL

BRASS

STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

COPPER

# ALUMINUM

## 6061-T6 DRAWN TUBE

Round  
12 Foot Lengths

O.D. (In Inches)		Wall		Pounds per Lineal Foot	O.D. (In Inches)		Wall		Pounds per Lineal Foot
		B. W. Gauge	Inches				B. W. Gauge	Inches	
$\frac{3}{16}$	X	20	.035	.020	1	X	18	.049	.172
		18	.049	.025			17	.058	.202
	X	20	.035	.028			16	.065	.224
$\frac{1}{4}$	X	18	.049	.036	$1\frac{1}{8}$	X	14	.083	.281
		17	.058	.041			20	.035	.141
	X	20	.035	.036			17	.058	.228
$\frac{5}{16}$	X	18	.049	.048	$1\frac{1}{4}$	X	20	.035	.157
		17	.058	.055			18	.049	.217
	X	20	.035	.044			17	.058	.256
$\frac{3}{8}$	X	18	.049	.059	$1\frac{3}{8}$	X	16	.065	.284
		17	.058	.068			14	.083	.357
	X	16	.065	.074			20	.035	.173
$\frac{7}{16}$	X	20	.035	.052	$1\frac{1}{2}$	X	17	.058	.282
		18	.049	.070			20	.035	.189
	X	16	.065	.089			18	.049	.263
$\frac{1}{2}$	X	22	.028	.049	$1\frac{5}{8}$	X	17	.058	.309
		20	.035	.060			16	.065	.344
	X	18	.049	.082			14	.083	.434
$\frac{5}{8}$	X	17	.058	.095	$1\frac{3}{4}$	X	20	.035	.206
		16	.065	.104			17	.058	.336
	X	22	.028	.062			14	.083	.510
$\frac{3}{4}$	X	20	.035	.076	2	X	17	.058	.363
		18	.049	.104			14	.083	.510
	X	17	.058	.121			17	.058	.389
$\frac{7}{8}$	X	16	.065	.134	$2\frac{1}{4}$	X	18	.049	.353
		20	.035	.092			17	.058	.416
	X	18	.049	.127			16	.065	.464
$\frac{15}{16}$	X	17	.058	.148	$2\frac{1}{2}$	X	14	.083	.590
		16	.065	.164			16	.065	.520
	X	14	.083	.204			14	.083	.660
1	X	20	.035	.109	3	X	16	.065	.580
		18	.049	.149			14	.083	.740
	X	17	.058	.175			16	.065	.700
		16	.065	.194			14	.083	.890
		20	.035	.125					

## 6061-T6 EXTRUDED TUBE

Round  
12 Foot Lengths

O.D. (In inches)		Wall (In inches)	Pounds per Lineal Foot	O.D. (In inches)		Wall (In inches)	Pounds per Lineal Foot
$1\frac{1}{2}$	X	.125	.635	$2\frac{1}{2}$	X	.125	1.10
		.250	1.15			.250	2.08
2	X	.125	.866	3	X	.125	1.33
		.250	1.62			.250	2.54

# ALUMINUM

## FURNITURE TUBE

Type III—Welded

Type II—Drawn

18 Foot Lengths

Type	O.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
11 & 111	3/4	X .049	.127
11		.065	.164
111	7/8	X .042	.129
11	1	X .032	.115

Type	O.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
11 & 111	1	X .042	.149
11		.049	.172
11		.065	.225

## 6062 ROUND TUBE

Bare Heat Exchanger  
Tube

O.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
5 1/2	.045	.920

O.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
7/8	.065	.194

## 6063-T832 DRAWN TUBE

Round

For TV Antenna Masts

10 Foot Lengths

O.D. (in inches)		Wall		Pounds per Lineal Foot
		B. W. Gauge	Inches	
1 3/8	X	19	.042	.207
1 1/2	X	19	.042	.226

## 6063-T5 EXTRUDED TUBE

Round

17 Foot Lengths

O.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
6	X .188	4.04

## Hollow Screw Machine Stock

ALLOYS: 2011-T3, 2011-T4511, 2017-T4511, 6062-T6511 AND 6062-T9

SIZE RANGE: 1" O.D. TO 2 1/4" O.D. IN 1/16" INCREMENTS  
2 3/4" O.D. TO 4" O.D. IN 1/8" INCREMENTS

WALL THICKNESS: 3/16" TO 1/2" IN 1/32" INCREMENTS

ALCOA ALUMINUM HOLLOW SCREW MACHINE STOCK IS FABRICATED TO CLOSE TOLERANCES PROVIDING A PRODUCT IDEALLY SUITED TO THE MANUFACTURE OF SCREW MACHINE PRODUCTS ON HIGH SPEED AUTOMATIC SCREW MACHINES.

STAINLESS STEEL

ROD • SHAPES • WIRE

INDUSTRIAL PRODUCTS

WEIGHTS

MONEL-NICKEL

BRASS

STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

COPPER

FOUNDRY • WELDING  
BRAZING PRODUCTS



# ALUMINUM

## Mechanical Tube (hollow rod)

ALLOYS: 2024-T4, 6061-T6 AND 7075-T6

SIZE RANGE: 1 1/4" O.D. TO 2 1/4" O.D. IN 1/8" INCREMENTS (IN 6061-T6 ONLY)  
2 1/4" O.D. TO 4" O.D. IN 1/4" INCREMENTS  
4" O.D. TO 8" O.D. IN 1/4" INCREMENTS  
8" O.D. TO 12" O.D. IN 1/2" INCREMENTS

WALL THICKNESS: 1/8" TO 1/2" IN 1/16" INCREMENTS  
1/2" TO 1" IN 1/8" INCREMENTS

ALCOA ALUMINUM MECHANICAL TUBE IS A PRODUCT THAT CAN BE MORE ECONOMICALLY MACHINED INTO A VARIETY OF PARTS THAN SOLID ROD USED FOR SIMILAR APPLICATIONS. IT IS FABRICATED TO TOLERANCES THAT ARE ENTIRELY ADEQUATE FOR MOST APPLICATIONS SINCE THE LARGER SIZES OF MECHANICAL TUBE ARE SELDOM MACHINED ON HIGH SPEED EQUIPMENT.

### 5050-O UTILITUBE ROUND TUBE

Coiled 50 and 100 Foot Lengths

O.D. (in inches)	Wall		Pounds per Lineal Foot
	B. W. Gauge	Inches	
1/8	X 23	.025*	.009
3/16	X 22	.028*	.017
1/4	X 21	.032*	.026
5/16	X 20	.035*	.036
3/8	X 20	.035*	.044

O.D. (in inches)	Wall		Pounds per Lineal Foot
	B. W. Gauge	Inches	
3/8	X 18	.049	.059
1/2	X 20	.035	.060
	18	.049*	.082
5/8	X 18	.049*	.104
3/4	X 17	.058*	.148

\*Approved by American Gas Association.

### 5050-O UTILITUBE ROUND TUBE

Coiled 500 and 1000 Foot  
Lengths

O.D. (in inches)	Wall		Pounds per Lineal Foot
	B. W. Gauge	Inches	
1/4	X 21	.032†	.026
5/16	X 20	.035†	.036

O.D. (in inches)	Wall		Pounds per Lineal Foot
	B. W. Gauge	Inches	
*3/8	X 20	.035†	.044
	* 18	.049	.059

\*In 500 foot lengths only.

†Approved by American Gas Association.

### 3003-H14 DRAWN HEAT EXCHANGER TUBE

Alclad Inside, 16 Foot Lengths

O.D. (in inches)	Wall		Pounds per Lineal Foot
	B. W. Gauge	Inches	
5/8	X 18	.049	.105
3/4	X 18	.049	.128
	16	.065	.166
1	X 18	.049	.174

O.D. (in inches)	Wall		Pounds per Lineal Foot
	B. W. Gauge	Inches	
1	X 16	.065	.226
	14	.083	.284
1 1/4	X 14	.083	.360

# ALUMINUM

## 3003-H12 WELDED HEAT EXCHANGER TUBE

Alclad Inside and Outside,  
16 Foot Lengths

O.D. (in inches)	Wall		Pounds per Lineal Foot	O.D. (in inches)	Wall		Pounds per Lineal Foot
	B. W. Gauge	Inches			B. W. Gauge	Inches	
3/4	X 18	.049	.128	1	X 18	.049	.174
	16	.065	.166		16	.065	.226

## 3003-H14 DRAWN HEAT EXCHANGER TUBE

Non-Clad, 16 Foot Lengths

O.D. (in inches)	Wall		Pounds per Lineal Foot
	B. W. Gauge	Inches	
5/8	X 18	.049	.105
3/4	X 16	.065	.166
1	X 16	.065	.226

## 6063-T5 SQUARE TUBE

Sharp Corners  
Extruded 21' 1" Lengths

Size (in inches)	Wall (in inches)	Pounds per Lineal Foot	Size (in inches)	Wall (in inches)	Pounds per Lineal Foot
3/4	.125	.376	1 1/2	.125	.825
1	.125	.526	1 3/4	.125	.974
1 1/4	.125	.674	2	.125	1.126

## 6063-T5 RECTANGULAR TUBE

Sharp Corners  
Extruded 21' 1" Lengths

Size (in inches)	Wall (in inches)	Pounds per Lineal Foot	Size (in inches)	Wall (in inches)	Pounds per Lineal Foot
1/2 X 1	.125	.383	1 3/4 X 3 1/2	.125	1.486
3/4 X 1 1/2	.125	.604	4	.125	1.633
1 X 1 1/2	.125	.677	4 1/2	.125	1.780
2	.125	.824	5	.125	1.927
1 1/4 X 2 1/2	.125	1.045	2 X 3	.125	1.412
1 1/2 X 2	.125	.971	5	.125	2.00
1 3/4 X 3	.125	1.339			

STAINLESS STEEL

SHEET • PLATE

ROD • SHAPES • WIRE

BRASS

STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

COPPER

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

## ALUMINUM

## 1100-F PIPE

## Schedule 40

To Drawn Tube Specifications  
20 Foot Lengths

S.P.S. (in inches)	Wall (in inches)	O.D. (in inches)	I.D. (in inches)	Pounds per Lineal Foot
1/2	.109	.840	.622	.294
3/4	.113	1.05	.824	.391
1	.133	1.315	1.049	.581
1 1/2	.145	1.900	1.610	.940
2	.154	2.375	2.067	1.26
3	.216	3.500	3.068	2.62

## 3003-H18 AND H112 PIPE

## Schedule 40

1/8" thru 3/4" Drawn, 1" thru 12"  
Extruded

20 Foot Lengths, Plain Ends

S.P.S. (in inches)	Wall (in inches)	O.D. (in inches)	I.D. (in inches)	Pounds per Lineal Foot
* 1/8 H18	.068	.405	.269	.085
* 1/4 "	.088	.540	.364	.147
* 3/8 "	.091	.675	.493	.196
1/2 "	.109	.840	.622	.294
3/4 "	.113	1.05	.824	.391
1 H112	.133	1.315	1.049	.586
1 1/4 "	.140	1.660	1.380	.793
1 1/2 "	.145	1.900	1.610	.948
2 "	.154	2.375	2.067	1.27
2 1/2 "	.203	2.875	2.469	2.02
3 "	.216	3.500	3.068	2.64
3 1/2 "	.226	4.000	3.548	3.18
4 "	.237	4.500	4.026	3.77
5 "	.258	5.563	5.047	5.08
6 "	.280	6.625	6.065	6.62
8 "	.322	8.625	7.781	9.97
10 "	.365	10.75	10.02	14.1
*12 "	.375	12.75	12.00	17.1

\*12-foot lengths.

## 6061-T6 PIPE

## Schedule 40

1/8" thru 3/4" Drawn, 1" thru  
12" Extruded

20 Foot Lengths, Plain Ends

S.P.S. (in inches)	Wall (in inches)	O.D. (in inches)	I.D. (in inches)	Pounds per Lineal Foot
* 1/8	.068	.405	.269	.085
* 1/4	.088	.540	.364	.147
* 3/8	.091	.675	.493	.196
1/2	.109	.840	.622	.294
3/4	.113	1.05	.824	.391
1	.133	1.315	1.049	.581

(Continued)

\*12 foot lengths.



# ALUMINUM

## 6061-T6 PIPE (Continued)

### Schedule 40

1/8" thru 3/4" Drawn, 1" thru  
12" Extruded

20 Foot Lengths, Plain Ends

S.P.S. (in inches)	Wall (in inches)	O.D. (in inches)	I.D. (in inches)	Pounds per Lineal Foot
1 1/4	.140	1.660	1.380	.786
1 1/2	.145	1.900	1.610	.940
2	.154	2.375	2.067	1.26
2 1/2	.203	2.875	2.469	2.00
3	.216	3.500	3.068	2.62
3 1/2	.226	4.000	3.548	3.15
4	.237	4.500	4.026	3.73
5	.258	5.563	5.047	5.06
6	.280	6.625	6.065	6.56
8	.322	8.625	7.981	9.88
10	.365	10.750	10.020	14.0
*12	.375	12.750	12.000	17.1

\*12 foot lengths.

## 6063-T6 PIPE

### Schedule 40

Extruded

20 Foot Lengths, Plain Ends

S.P.S. (in inches)	Wall (in inches)	O.D. (in inches)	I.D. (in inches)	Pounds per Lineal Foot
1/2	.109	.840	.622	.294
3/4	.113	1.050	.824	.391
1	.133	1.315	1.049	.581
1 1/4	.140	1.660	1.380	.786
1 1/2	.145	1.900	1.610	.940
2	.154	2.375	2.067	1.26
2 1/2	.203	2.875	2.469	2.00
3	.216	3.500	3.068	2.62
3 1/2	.226	4.000	3.548	3.15
4	.237	4.500	4.026	3.73
5	.258	5.563	5.047	5.06
6	.280	6.625	6.065	6.56
8	.322	8.625	7.981	9.88
10	.365	10.75	10.020	14.00
*12	.375	12.75	12.000	17.1

\*12 foot lengths.

STAINLESS STEEL

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

BRASS

STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

COPPER

FOUNDRY • WELDING  
BRAZING PRODUCTS

# ALUMINUM

ALUMINUM

## 6061-T6 PIPE

Schedule 80

20 Foot Lengths, Plain Ends

S.P.S. (in inches)	Wall (in inches)	O.D. (in inches)	I.D. (in inches)	Pounds per Lineal Foot
1	.179	1.315	.957	.751
1 1/4	.191	1.660	1.278	1.037
1 1/2	.200	1.900	1.500	1.256
2	.218	2.375	1.939	1.737
3	.300	3.500	2.900	3.547
3 1/2	.318	4.000	3.364	4.326
4	.337	4.500	3.826	5.183
5	.375	5.563	4.813	7.188

## 6063-T6 PIPE

Schedule 10

20 Foot Lengths, Plain Ends

S.P.S. (in inches)	Wall (in inches)	O.D. (in inches)	I.D. (in inches)	Pounds per Lineal Foot
3/4	.083	1.050	.884	.297
1	.109	1.315	1.097	.486
1 1/4	.109	1.660	1.442	.625
1 1/2	.109	1.900	1.682	.721
2	.109	2.375	2.157	.913
2 1/2	.120	2.875	2.635	1.221
3	.120	3.500	3.26	1.498
4	.120	4.500	4.26	1.942
5	.134	5.563	5.295	2.686
6	.134	6.625	6.357	3.214

## 6063-T6 PIPE

Schedule 5

20 Foot Lengths, Plain Ends

S.P.S. (in inches)	Wall (in inches)	O.D. (in inches)	I.D. (in inches)	Pounds per Lineal Foot
1 1/4	.065	1.660	1.530	.383
1 1/2	.065	1.900	1.770	.441
2	.065	2.375	2.245	.555
2 1/2	.083	2.875	2.709	.856
3	.083	3.500	3.334	1.048
4	.083	4.500	4.334	1.354
5	.109	5.563	5.345	2.195
6	.109	6.625	6.407	2.623

NEW YORK  
WORTH 4  
P. O. Box

CARTER  
P. O. Box  
Milik Str  
Yorktown  
Dir. Dist  
TWX-20

HARRIS  
1000 South  
Humboldt  
Dir. Dist  
TWX-20

CAMBRIDGE  
281 Albany  
Trowbridge  
Dir. Dist  
TWX-61

PHILADELPHIA  
1955 W. F  
Baldwin  
Dir. Dist  
TWX-215

# ALUMINUM

## 6063-T6 CONSTRUCTION PIPE

20 Foot, 30 Foot, and 40 Foot Lengths

O.D. (in inches)	Wall (in inches)	I.D. (in inches)	Pounds per Lineal Foot
2	.050	1.914	.360
3		2.914	.545
4		3.906	.730
5	.052	4.896	.951
6	.058	5.884	1.273
7	.064	6.872	1.640
8	.072	7.856	2.109

## 6063-T832 HANDRAIL PIPE

20 Foot Lengths, Plain Ends

S.P.S. (in inches)	Pounds per Lineal Foot
1 1/4 SCHEDULE 10	.625
1 1/4 SCHEDULE 40	.786
1 1/2 " "	.940

## UNITRACE PIPE AND FITTINGS

6063-T5, Extruded  
30 Foot Standard Lengths

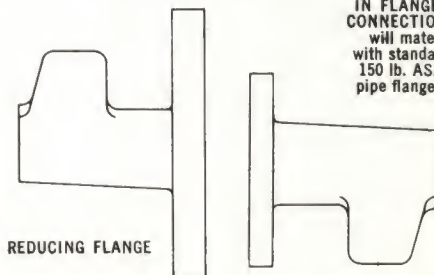
UNITRACE Size (in inches)	Pounds Per 100 Feet	UNITRACE FITTING WEIGHTS (Pounds Each)			
		Trace Cap	Connecting Flange	Reducing Flange	
				Weight	Reduction
1 1/2	116.2	.11	1.60	4.0	2 1/2"-1 1/2"
2	159.8	.16	2.50	5.1	3"-2"
3	271.9	.26	4.80	6.1	4"-3"
4	390.2	.37	7.00	11.1	6"-4"
6	905.0	.60	12.2	17.0	8"-6"



TRACE CAP



UNITRACE PIPE



REDUCING FLANGE

CONNECTING FLANGE

BOLT HOLES  
IN FLANGED  
CONNECTIONS  
will mate  
with standard  
150 lb. ASA  
pipe flanges.

STAINLESS STEEL

BRASS

STRUCTURAL SHAPES

EXTRUDED SHAPES  
• CASTINGS

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS



# ALUMINUM

ALUMINUM

YOU  
SERV  
YOU  
META

NEW  
Worth 4  
P. O. Bo  
  
CARTE  
P. O. Bo  
Milik Str  
YOrktow  
Dir. Dist  
TWX-20

HARRIS  
1000 Sou  
Humbold  
Dir. Dist  
TWX-20

CAMBR  
281 Albar  
TRowbric  
Dir. Dist  
TWX-617

PHILAD  
1955 W. I  
Baldwin  
Dir. Dist  
TWX-215

## 6063-T42 RIGID CONDUIT

10 Foot Lengths

Threaded Both Ends, With One Coupling Furnished.

Trade Size (in inches)	Pounds per Lineal Foot *	Trade Size (in inches)	Pounds per Lineal Foot *
$\frac{1}{2}$	.298	2	1.288
$\frac{3}{4}$	.398	2 $\frac{1}{2}$	2.047
1	.589	3	2.680
1 $\frac{1}{4}$	.798	3 $\frac{1}{2}$	3.213
1 $\frac{1}{2}$	.956	4	3.821

\*Weight includes coupling.

## 6061-T6 EQUAL ANGLES

15-25 Foot Random Lengths

Size (in inches)	Pounds Per Foot	Size (in inches)	Pounds Per Foot	Size (in inches)	Pounds Per Foot
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{8}$	.20	$1 \frac{3}{4} \times 1 \frac{3}{4} \times \frac{1}{8}$	.50	3 $\times$ 3 $\times$ $\frac{3}{16}$	1.29
1 $\times$ 1 $\times$ $\frac{1}{8}$	.27	$\times$ $\frac{3}{16}$	.73	$\times$ $\frac{1}{4}$	1.68
$\times$ $\frac{3}{16}$	.40	$\times$ $\frac{1}{4}$	.95	$\times$ $\frac{5}{16}$	2.08
$\times$ $\frac{1}{4}$	.51	2 $\times$ 2 $\times$ $\frac{1}{8}$	.57	$\times$ $\frac{3}{8}$	2.48
$1 \frac{1}{4} \times 1 \frac{1}{4} \times \frac{1}{8}$	.35	$\times$ $\frac{3}{16}$	.84	*3 $\frac{1}{2} \times 3 \frac{1}{2} \times \frac{3}{16}$	2.65
$\times$ $\frac{3}{16}$	.51	$\times$ $\frac{1}{4}$	1.11	4 $\times$ 4 $\times$ $\frac{1}{4}$	2.28
$\times$ $\frac{1}{4}$	.66	$\times$ $\frac{3}{8}$	1.60	$\times$ $\frac{5}{16}$	2.82
$1 \frac{1}{2} \times 1 \frac{1}{2} \times \frac{1}{8}$	.43	$2 \frac{1}{2} \times 2 \frac{1}{2} \times \frac{3}{16}$	1.07	$\times$ $\frac{3}{8}$	3.36
$\times$ $\frac{3}{16}$	.62	$\times$ $\frac{1}{4}$	1.41		
$\times$ $\frac{1}{4}$	.81	$\times$ $\frac{5}{16}$	1.73		

\*Extruded

## 6061-T6 UNEQUAL ANGLES

15-25 Foot Random Lengths

Size (in inches)	Pounds Per Foot	Size (in inches)	Pounds Per Foot	Size (in inches)	Pounds Per Foot
$1 \frac{1}{2} \times 1 \frac{1}{4} \times \frac{1}{8}$ *	.39	2 $\times$ 1 $\frac{1}{2} \times \frac{1}{8}$	.49	3 $\times$ 2 $\times$ $\frac{3}{16}$	1.07
$\times$ $\frac{3}{16}$ *	.56	$\times$ $\frac{3}{16}$	.73	$\times$ $\frac{1}{4}$	1.40
$\times$ $\frac{1}{4}$ *	.74	$\times$ $\frac{1}{4}$	.95	$\times$ $\frac{3}{8}$	2.05
$1 \frac{3}{4} \times 1 \frac{1}{4} \times \frac{1}{8}$ *	.43	$2 \frac{1}{2} \times 2 \times \frac{3}{16}$	.96	*3 $\times$ 2 $\frac{1}{2} \times \frac{1}{4}$	1.53
$\times$ $\frac{3}{16}$ *	.62	$\times$ $\frac{1}{4}$	1.25	*3 $\frac{1}{2} \times 2 \frac{1}{2} \times \frac{1}{4}$	1.68
$\times$ $\frac{1}{4}$ *	.81	$\times$ $\frac{5}{16}$	1.54	4 $\times$ 3 $\times$ $\frac{1}{4}$	1.99
				$\times$ $\frac{3}{8}$	2.92
				6 $\times$ 4 $\times$ $\frac{3}{8}$	4.25

\*Extruded

# ALUMINUM

## 6061-T6 CHANNELS

American Standard  
15-25 Foot Random Lengths

Size in inches	Web Thick- ness	Width of Flange	Pounds Per Foot	Size in inches	Web Thick- ness	Width of Flange	Pounds Per Foot
3 X	.170	1.410	1.42	5 X	.472	2.032	3.97
	.258	1.498	1.73	6 X	.225	1.945	3.00
	.356	1.596	2.07		.314	2.034	3.62
4 X	.180	1.580	1.84		.437	2.157	4.49
	.247	1.647	2.15	7 X	.230	2.110	3.53
	.320	1.720	2.50	8 X	.250	2.290	4.25
5 X	.190	1.750	2.31		.487	2.527	6.47
	.325	1.885	3.10				

## 6061-T6 I BEAMS

American Standard  
15-25 Foot Random Lengths

Size in inches	Web Thick- ness	Width of Flange	Pounds Per Foot	Size in inches	Web Thick- ness	Width of Flange	Pounds Per Foot
3 X	.170	2.330	1.96	5 X	.210	3.000	3.42
	.349	2.509	2.59		.494	3.284	5.09
4 X	.190	2.660	2.64	6 X	.230	3.330	4.30
	.326	2.796	3.28		.343	3.443	5.09

\*Extruded

## 6061-T6 H BEAMS

Extruded  
15-25 Foot Random Lengths

Size in inches	Web Thick- ness	Width of Flange	Pounds Per Foot
4 X	.313	4.000	4.70

STAINLESS STEEL

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STRUCTURAL SHAPES

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## 6061-T6 TEES

Extruded  
15-25 Foot Random Lengths

Size (in inches)	Pounds per Foot
*2 X 2 X 1/4	1.25
†1 1/2 X 1 1/4 X 1/4	.78

\*This Tee has tapered stem and flanges.

†This Tee has uniform thickness in stem and flanges.

## 6061-T6 ZEES

Extruded  
15-25 Foot Random Lengths

Size (in inches)	Pounds per Foot
3 X 1/4 X 2 11/16	2.33

## EXTRUDED SHAPES

Die Number	Alloy	Length (in Foot)	Pounds Per Foot	Approximate Shape	Accessories	Drawing Page Number
10	6063-T42	16	.206	Counter Edge	—	61
63	6063-T42	16	.188	Tee (Divider Strip)	—	61
74A	6063-T42	16	.107	Belt Moulding	—	61
74B	6063-T42	16	.128	" "	—	61
74C	6063-T42	16	.086	" "	—	61
74D	6063-T42	16	.228	" "	—	61
74E	6063-T42	16	.192	" "	—	61
74F	6063-T42	16	.257	" "	—	61
74H	6063-T42	16	.137	" "	—	61
74P	6063-T42	16	.418	" "	—	61
74Q	6063-T42	16	.152	" "	—	61
78K	6062-T6	22	.106	Angle	—	61
79A	6063-T5	16	.206	"	—	62
79B	6063-T5	16	.408	"	—	62
79E	6063-T5	16	1.12	"	—	62
79G	6063-T5	16	.281	"	—	62
79H	6063-T5	16	.131	"	—	62
79M	6063-T5	16	.145	"	—	62
79N	6063-T5	16	.633	"	—	62
79O	6063-T5	16	.168	"	—	62
79P	6063-T5	16	.519	"	—	62
79Q	6063-T5	16	.856	"	—	62
79T	6063-T5	16	.356	"	—	62
79V	6063-T5	16	.431	"	—	62
79X	6063-T5	16	.581	"	—	62
79Y	6063-T5	16	.506	"	—	62
141	6063-T42	16	.431	Belt Moulding	—	61
251	6063-T42	16	.228	Glass Stop or Cove	—	61

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YOU  
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MET

NEW  
Worth  
P. O. E

CART  
P. O. E  
Milik S  
Yorkto  
Dir. D  
TWX-4

HARRIS  
1000 So  
HUmbo  
Dir. Dist  
TWX-20

CAMBR  
281 Alba  
TRowbr  
Dir. Dist  
TWX-61

PHILAD  
1955 W.  
BALDWIN  
Dir. Dist  
TWX-21



# ALUMINUM

## EXTRUDED SHAPES (Continued)

Die Number	Alloy	Length (in Feet)	Pounds Per Foot	Approximate Shape	Accessories	Drawing Page Number
363	6063-T42	16	.356	Belt Moulding	—	61
472	6063-T5	16	.108	Angle	—	62
510	6063-T42	16	.212	Belt Moulding	—	62
627	6063-T42	16	.184	Drip Moulding	—	62
650	6063-T42	16	.191	Belt Moulding	—	62
661	6063-T42	16	.168	Quarter Oval	—	62
668	6063-T42	16	.307	Drip Moulding	—	63
771C	6062-T6	22	.938	Zee	—	63
787	6063-T42	16	.433	Corner Tee	—	63
853-B	6062-T6	22	.450	"	—	63
853-F	6062-T6	22	.320	"	—	63
853-G	6062-T6	22	.890	"	—	63
853-K	6062-T6	22	.700	"	—	63
853-N	6062-T6	22	.628	"	—	63
892	6062-T6	22	1.67	Channel	—	63
895	6063-T5	16	.244	Angle	—	62
1001	6063-T42	16	.174	Belt Moulding	—	64
1122	6063-T42	16	.558	Belt Moulding	—	64
1257	6063-T5	16	.319	Tee	—	63
1312	6063-T5	16	.070	Angle	—	62
1445	6063-T42	16	.093	Counter Edge	—	64
1843	6063-T42	16	.058	Crescent	—	64
1940	6063-T5	20	.263	Channel	—	64
1943	6063-T5	16	.158	Angle	—	62
1944	6063-T5	16	.116	"	—	62
2105	6063-T5	16	.450	Channel	—	64
2296	6062-T6	24	1.03	"	—	65
2335	6063-T5	16	.150	"	—	64
2372	6063-T5	16	.473	Pilaster	—	65
2388	6063-T5	16	.413	Channel	—	64
2715	6063-T5	16	.187	"	—	64
2748	6063-T5	16	.563	"	—	64
2749	6063-T5	16	.148	"	—	64
2880	6063-T6	16	1.11	Angle — Corner Post	—	62
3164	6063-T5	16	.902	Pilaster	—	65
3507	6063-T5	20	.251	Channel	—	64
3513	6063-T5	16	.596	Corner Trim	—	65
3514	6063-T5	16	.830	" "	—	65
3547	6063-T5	16	.300	Channel	—	64
3616	6063-T5	16	1.18	Trim	—	65
3619	6063-T5	16	.120	Channel	—	65
3636	6063-T5	16	1.82	Pilaster	—	65
3728	6063-T5	16	1.16	Door Frame	—	66
3776	6063-T5	16	.713	Channel	—	64
4286	6063-T5	20	.300	"	—	64
4300	6063-T5	20	.337	"	—	64
4308	6063-T5	16	.248	Glass Stop	—	66
4477	6063-T5	16	.228	Semi-Hollow Trim	—	66
4490	6063-T5	16	.954	Base Mold	—	66
4533	6063-T5	16	.244	Channel	—	64
4542	6063-T5	16	.526	"	—	64
4619	6062-T6	24	1.16	Rub Rail	—	66
4716	6063-T5	16	.280	Tee	—	63
5137	6063-T5	16	.319	Angle	—	62
5389	6063-T5	16	.431	Door Frame	—	66
5390	6063-T5	16	.528	Glass Frame	—	66
5391	6063-T5	16	.209	" "	—	67
5392	6063-T5	16	.438	Door Frame	—	67
5393	6063-T5	16	.431	" "	—	67
5527	6063-T5	20	.564	Channel	—	64
5714	6063-T5	16	.524	Channel	—	64
5951	6063-T5	16	.300	Tee	—	63
6474	6063-T5	16	.135	Glass Frame	—	67
6498	6063-T5	16	1.36	Door Frame	—	67
6594	6063-T5	16	.563	Channel	—	64

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EXTRUDED SHAPES  
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# ALUMINUM

## EXTRUDED SHAPES (Continued)

Die Number	Alloy	Length (in Feet)	Pounds Per Foot	Approximate Shape	Accessories	Drawing Page Number
6699	6063-T6	24	.788	H Beam	—	67
6746	6063-T5	16	.694	Angle	—	62
6801	6063-T5	16	.488	Column Post	—	67
6844	6063-T5	16	.431	Angle	—	62
7030	6063-T5	16	.328	Tee	—	63
7032	6063-T5	16 1/4	1.80	Threshold	—	67
7088	6062-T6	22	1.02	Zee	—	68
7201	6063-T5	16	.206	Angle	—	62
7385	6063-T5	16	.244	Channel	—	62
7484	6063-T5	16	.413	Channel	—	64
7498	6063-T5	22	2.39	Vault Moulding	—	68
7499	6063-T5	22	2.95	"	—	68
7613	6063-T5	16	.356	Angle	—	62
7648	6063-T5	16	1.35	Door Frame	—	68
8321	6063-T5	16	.365	Trim	—	68
8449	6063-T5	16	.374	Channel	—	64
8467	6063-T5	16	.806	Pilaster	—	68
8604	6062-T6	22	1.16	Side Post	—	68
8606	6062-T6	22	.797	Roof Bow	—	69
8792	6063-T5	16	1.31	Door Frame	—	64
8997	6063-T5	16	.263	Channel	—	64
9004	6062-T6	24	.533	"	—	69
9418	6063-T5	16	1.18	Vault Moulding	—	69
9419	6063-T5	16	.925	"	—	69
9553	6063-T5	16	.674	Trim	—	69
10346	6063-T5	16 1/4	.180	Threshold	—	69
10347	6063-T5	16 1/4	.232	"	—	69
10351	6063-T5	16 1/4	.476	Saddle	—	70
10352	6063-T5	16 1/4	.894	"	—	70
10353	6063-T5	16 1/4	.595	Threshold	—	70
10758	6062-T6	22	.369	Slat	—	70
12919	6063-T5	16	.274	Glass Stop	—	70
16505	6063-T5	20	.852	Handrail	Use Bracket 303-B, Scroll 16505-S, Channel Scroll 16505-C, Terminal End 16505-E.	70
(see 90503)						
17146	6063-T5	16	1.94	Channel	—	64
18307	6063-T5	16	.206	Tee	—	63
18308	6063-T5	16	.224	"	—	63
18906	6063-T5	16	.394	"	—	63
19047	6063-T5	16 1/4	.829	Saddle	—	70
19048	6063-T5	16 1/4	1.10	"	—	70
19049	6063-T5	16 1/4	1.23	"	—	70
20609	6063-T5	20	.770	Handrail	Use Bracket 302-B, Scroll 20609-S, Channel Scroll 20609-C, Terminal End 20609-E, Lambs Tongue 20609-L.	71
20999	6063-T5	16 1/4	.661	Threshold	—	71
22266	6063-T5	20	.360	Channel	—	64
22819	6062-T6	24	1.29	Channel	—	71
23681	6063-T5	20	.690	Handrail	Use Bracket 302-B	71
23787	6063-T5	16	.319	Zee	—	71
24531	6062-T6	24	.898	Side Post	—	71
25055	6063-T5	16	.281	Tee	—	63
25300	6063-T5	20	.694	Handrail	Use Bracket 302-B	71
26593	6063-T42	20	.720	Window Stool	—	71
26638	6063-T5	16 1/4	1.78	Saddle	—	70
26936	6063-T6	22	.064	Snapmold	—	71
26937	6063-T6	22	.040	"	—	72
34040	6063-T5	17	5.64	Hollow 3 Trim	—	72
34096	6063-T5	16	5.87	Newell Hollow 2	—	72

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# ALUMINUM

## EXTRUDED SHAPES (Continued)

Die Number	Alloy	Length (in Feet)	Pounds Per Foot	Approximate Shape	Accessories	Drawing Page Number
37734	6063-T42	21	.524	Window Sill	—	72
37735	6063-T42	21	.574	" "	—	72
37736	6063-T42	21	.636	" "	—	72
37737	6063-T42	21	.691	" "	—	72
37738	6063-T42	21	.746	" "	—	72
37739	6063-T42	21	.804	" "	—	72
38649	6063-T5	16½	.689	Threshold	—	70
38651	6063-T5	16½	.721	Saddle	—	70
38653	6063-T5	16½	.194	Threshold	—	69
38654	6063-T5	16½	.224	"	—	69
38658	6063-T5	16½	.760	"	—	71
39258	6063-T42	½	1.12	Semi-Hollow Cover Plate	—	73
39259	6063-T42	9—11½	.978	Gravel Stop	See Section Assembly, Page 59.	73
40517	6062-T6	22	.787	Channel	—	64
42058	6063-T42	9—11½	.838	Gravel Stop	See Section Assembly, Page 59.	73
42059	6063-T42	9—11½	.697	" "	See Section Assembly, Page 59.	73
42060	6063-T42	½	1.48	Semi-Hollow Cover Plate	—	73
42061	6063-T42	½	1.002	" " " "	—	73
42062	6063-T42	½	.826	" " " "	—	73
42063	6063-T42	9—11½	1.315	Gravel Stop	See Section Assembly, Page 59.	73
45872	6062-T6	22-24-26	1.25	Side Sill	—	73
45873	6063-T6	22-24-26	.499	Lintel	—	73
45874	6062-T6	22-24-26	1.57	Roof Rail	Use Corner Casting 45874-B, 45874-S, 45874-R.	74
45875	6062-T6	16	1.39	Corner Post	—	74
45876	6062-T6	24	.498	Side Post	—	74
45877	6063-T6	16	.424	Rub Rail	—	74
45878	6063-T6	22-24-26	.517	Lintel	—	74
45879	6062-T6	24	.760	Door Post	—	74
45603	6063-T6	16	.784	Side Post	—	74
54684	6063-T42	21	.767	Window Sill	—	75
54685	6063-T42	21	.842	" "	—	75
54686	6063-T42	21	.919	" "	—	75
54687	6063-T42	21	.994	" "	—	75
54688	6063-T42	21	1.07	" "	Use Anchor Clip SA-100	75
54689	6063-T42	21	1.14	" "	—	75
54690	6063-T42	21	1.53	" "	—	75
54691	6063-T42	21	1.72	" "	—	75
54692	6063-T42	21	2.19	" "	—	75
54693	6063-T42	21	2.41	" "	—	75
58219	6063-T5	16	.096	End Stop	—	75
58221	6063-T5	16	.624	Plaster Stop	—	75
58222	6063-T5	16	.385	Anchor	—	75
58229	6063-T5	16	.437	Picture Mold	—	75
58391	6063-T5	16	.604	Corner Trim	—	75
60585	6063-T5	16½	.740	Threshold	—	76
60586	6063-T5	16½	1.01	"	—	76
60587	6063-T5	16½	1.18	"	—	76
60588	6063-T5	16½	1.35	Threshold	—	76
64016	6063-T5	16	1.060	Fascia	—	76
64097	6063-T5	16	1.208	Fascia	—	76
66293	6063-T5	20	.614	Handrail	Use Bracket 301-B	77
66294	6063-T5	20	.716	"	Use Bracket 301-B, Scroll 66294-S, Channel Scroll 66294-C, Terminal End 66294-E, Lambs Tongue 66294-L.	77
66295	6063-T5	20	.835	Handrail	Use Bracket 301-B	77
66582	6063-T6	16	.923	Coping	—	77

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# ALUMINUM

## EXTRUDED SHAPES (Continued)

Die Number	Alloy	Length (in Feet)	Pounds Per Foot	Approximate Shape	Accessories	Drawing Page Number
66588	6063-T42	9'11½"	.930	Gravel Stop	See Section Assembly, Page 59.	73
66589	6063-T42	½	1.144	Cover Plate	—	73
66611	6063-T42	9'10½"	2.412	Coping G-8	See Section Assembly, Page 59.	77
68755	6063-T42	9'11½"	1.606	Gravel Stop	See Section Assembly, Page 59.	77
69177	6063-T42	9'10½"	3.702	Coping G-12	See Section Assembly, Page 59.	77
70421	6063-T5	16	.194	Drip Mold	—	78
70422	6063-T5	16	.947	Picture Mold	Use Snap-on Clip SC-201.	78
70423	6063-T5	16	.802	" "	Use Snap-on Clip SC-201.	78
70424	6063-T5	16	.613	Base Mold	Use Snap-on Clip SC-201.	78
70425	6063-T5	16	.209	Wall Trim	Use Snap-on Clip SC-202.	78
70426	6063-T5	16	.186	Trim	Use Snap-on Clip SC-202.	78
77563	6063-T5	16	.098	End Stop Anchor	—	78
77564	6063-T5	16	.108	Fascia End Stop	—	78
79587	6063-T42	9'11½"	.468	Flashing Cap	—	79
79588	6063-T42	9'11½"	1.387	Gravel Stop Type EE	See Section Assembly, Page 59.	79
79589	6063-T42	9'11½"	.316	Fascia	—	79
79590	6063-T42	9'11½"	.443	Soffit Trim	—	79
79591	6063-T42	9'11½"	1.126	Gravel Stop Type FF	See Section Assembly, Page 59.	79
79592	6063-T42	9'11½"	1.129	" " "	—	80
79800	6063-T6	30-32-35	1.962	Reefer Flooring	—	80
79801	6063-T6	30-32-35	1.830	" " "	—	80
79802	6063-T42	30-32-35	1.152	Edge Finisher	—	80
79803	6063-T42	30-32-35	1.560	Edge Starter	—	81
79804	6063-T6	30-32-35	.794	Center Starter	—	81
79805	6063-T6	30-32-35	2.176	Dry Freight Flooring	—	81
79806	6063-T6	30-32-35	.752	Center Starter	—	81
79840	6063-T5	21'1"	1.724	Mullions or Frames	Channel 1940 Suggested	81
79841	6063-T5	21'1"	1.800	" " "	Glass stop with these shapes	81
84701	6063-T5	16	.590	Cove Base	Use Snap-On Clip SC-201	81
84702	6063-T5	16	.312	Multipurpose Trim	Use Snap-On Clip SC-202	82
84781	6063-T5	16	.211	Threshold Miter Strip	—	82
84782	6063-T5	16¼	.630	Type H Threshold 4"	—	82
84783	6063-T5	16¼	.804	" " 5"	—	82
84784	6063-T5	16¼	.988	" " 6"	—	82
84785	6063-T5	16¼	1.127	" " 7"	—	82
84968	6063-T42	9'11½"	1.315	Gravel Stop, Type F	See Section Assembly, Page 59.	73
84969	6063-T42	½	1.578	Joint Cover	—	73
87066	6063-T5	16	.820	Fascia	—	82
87067	6063-T5	20	.446	Handrail	Mating Channel 1940	83
87068	6063-T5	20	.871	Handrail	Mating Channel 87071	83
87069	6063-T5	16	.341	Tee	—	83
87070	6063-T5	16	.209	Angle	—	62
87071	6063-T5	20	.374	Channel	—	64
87095	6063-T42	½	1.142	Joint Cover	—	73
87096	6063-T42	9'11½"	.978	Gravel Stop Type F	See Section Assembly, Page 59.	73
87097	6063-T42	9'11½"	.696	Gravel Stop Type F	See Section Assembly, Page 59.	73
87098	6063-T42	½	.860	Joint Cover	—	73

Continued on next page

## EXTRUDED SHAPES (Continued)

Die Number	Alloy	Length (in Feet)	Pounds Per Foot	Approximate Shape	Accessories	Drawing Page Number
90503	6063-T5	20'	.980	Hand Rail	(see 16505)	83
111291	6063-T42	9'11½"	1.853	Gravel Stop, Type H	See Section Assemblies, Page 59.	83
111301	6063-T42	½	1.26	Joint Cover	—	83
112331	6063-T42	9'11½"	1.811	Gravel Stop, Type F	See Section Assemblies, Page 59.	84
117861	6063-T42	9'11½"	1.445	" " " H	See Section Assemblies, Page 59.	84
117871	6063-T42	½	1.004	Joint Cover	—	84
125571	6063-T42	½	2.516	" " "	—	84
132562	6063-T42	9'11½"	.661	Fascia	59	84
132572	6063-T42	9'11½"	.445	Soffit Trim	—	84

## SECTION ASSEMBLIES

### GRAVEL STOPS — COPINGS & ACCESSORIES

Section	Gravel Stop	Joint Cover	Fascia	Soffit	Outside Corner	Inside Corner	Anchor Plate
<b>TYPE F</b>							
39259	39259	39258	—	—	15092	15093	—
42058	42058	42061	—	—	15096	15087	—
42059	42059	42062	—	—	15098	15089	—
42063	42063	42060	—	—	15090	15091	—
66588	66588	66589	—	—	15094	15095	—
84968	84968	84969	—	—	15485	15484	—
87096	87096	87095	—	—	15483	15482	—
87097	87097	87098	—	—	15481	15480	—
112331	112331	125571	—	—	15497	15496	—
<b>TYPE E</b>							
68755*	68755	15045	—	—	15021	15020	15088
<b>TYPE EE</b>							
79587-8**	79588	15354	79589	79590	15391	15390	15355
<b>TYPE FF</b>							
79591	79591	15358	79589	79590	15357	15356	—
79592	79592	15361	79589	79590	15360	15359	—
<b>TYPE H</b>							
117861	117861	117871	132562	132572	15503	15502	—
111291	111291	111301	132562	132572	15505	15504	—
<b>COPING</b>							
<b>TYPE G 8</b>							
66611†	66611	15022	—	—	15065	15064	15108
<b>TYPE G 12</b>							
69177††	69177	15023	—	—	15067	15066	15122

\*Include 15086 Pitch Dam  
 \*\* " 79587 Flashing Cap  
 † " 15040 Gutter Bar  
 †† " 15038 Gutter Bar

# ALUMINUM

## HANDRAIL CASTINGS

(For Die Drawings,  
See Pages 85-86)

Die Number	Description
301-B	BRACKET FOR HANDRAILS UNDER 2' WIDE
302-B	BRACKET FOR HANDRAILS OVER 2' WIDE
303-B	(16505-B) BRACKET FOR HANDRAIL DIE 16505 AND OTHER RAILS OVER 2' WIDE
16505-CR	CHANNEL SCROLL
20609-C	CHANNEL SCROLL
66294-C	CHANNEL SCROLL
16505-ER	(16505-RE) TERMINAL END
20609-E	TERMINAL END
66294-E	TERMINAL END
20609-L	LAMBS TONGUE
66294-L	LAMBS TONGUE
16505-SR	SCROLL LEFT OR RIGHT
20609-S	SCROLL LEFT OR RIGHT
66294-S	SCROLL LEFT OR RIGHT

## TRUCK BODY CASTINGS

**356-T6 Alloy**  
(For Die Drawings,  
See Page 86)

Die Number	Description
16-B-48	CORNER CASTINGS FOR DIE 9006
45873	LINTEL CORNER CASTING FOR DIE 45873
45874-B	BALL CORNER CASTING
45874-S	SQUARE CORNER CASTING
14007	CORNER CASTING FOR DIE 14007
45874-R	CORNER CASTING FOR DIE 45874

## CLIPS

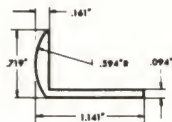
(For Die Drawings,  
See Page 86)

Die Number	Description
SC-201	STEEL SPRING CLIPS FOR DIES 70422-70423-70424
SC-202	STEEL SPRING CLIPS FOR DIES 8321-70425-70426
SA-100	WINDOW SILL CLIP FOR DIES 54684- THRU 54693



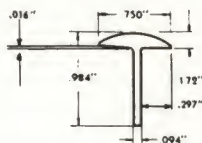
# ALUMINUM

COUNTER EDGE 10



EST. WT. PER FT.—204 LB.  
FACTOR 17

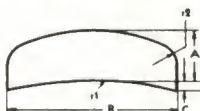
TEE (Divider Strip) 63



EST. WT. PER FT.—188 LBS.  
FACTOR 16

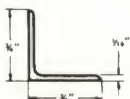
BELT MOLDING

74



Section number	A	B	C	r <sup>1</sup>	r <sup>2</sup>	Est. weight per foot	Factor
74C	0.188	0.500	0.019	0.500	0.188	0.086	14
74A	0.188	0.625	0.019	0.625	0.188	0.107	14
74B	0.188	0.750	0.020	0.750	0.188	0.128	13
74H	0.188	0.875	0.019	0.875	0.188	0.137	14
74O	0.188	1.000	0.020	1.000	0.188	0.152	13
74E	0.250	0.875	0.025	0.875	0.250	0.192	10
74D	0.250	1.000	0.025	1.250	0.203	0.228	10
74F	0.250	1.250	0.025	1.250	0.250	0.257	10
74P	0.250	2.000	0.025	4.000	0.250	0.418	9

ANGLE 78K



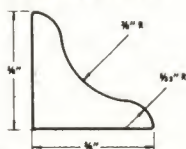
EST. WT. PER FT.—104 LBS.  
FACTOR 27

BELT MOLDING 141



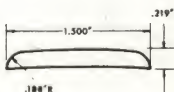
EST. WT. PER FT.—421 LBS.  
FACTOR 8

GLASS STOP OR CORNER COVE 251



EST. WT. PER FT.—226 LBS.  
FACTOR 10

BELT MOLDING 363



EST. WT. PER FT.—356 LB.  
FACTOR 9

STAINLESS STEEL

SHEET • PLATE

ROD • SHAPES • WIRE

BRASS

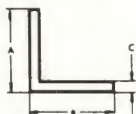
MONEL-NICKEL

COPPER

FOUNDRY • WELDING  
BRAZING PRODUCTS

# ALUMINUM

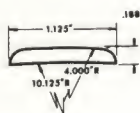
## ANGLES—EQUAL AND UNEQUAL LEGS, SHARP CORNERS



Section number	A inches	B inches	C inches	Est. weight per foot, pounds	Factor
1944	0.375	0.750	0.094	0.116	19
1312	0.500	0.500	0.065	0.070	28
79-H	0.500	0.500	0.125	0.131	15
1943	0.500	1.000	0.094	0.158	19
7201	0.500	1.000	0.125	0.206	15
895	0.500	1.250	0.125	0.244	14
79-O	0.625	0.625	0.125	0.168	15
472	0.750	0.750	0.062	0.108	28
79-A	0.750	0.750	0.125	0.206	14
7385	0.750	1.000	0.125	0.244	14
5137	0.750	1.500	0.125	0.319	14
79-M	1.000	1.000	0.062	0.145	28
79-G	1.000	1.000	0.125	0.281	14
7613	1.000	1.000	0.188	0.408	10
87070	1.375	0.875	0.125	0.356	14
6844	1.000	2.000	0.125	0.209	25
				0.431	14
79-T	1.250	1.250	0.125	0.356	14
79-P	1.250	1.250	0.188	0.519	10
6746	1.250	3.500	0.125	0.694	14
79-V	1.500	1.500	0.125	0.431	14
79-N	1.500	1.500	0.188	0.633	9
79-Y	1.750	1.750	0.125	0.506	14
79-X	2.000	2.000	0.125	0.581	14
79-Q	2.000	2.000	0.188	0.857	9
79-E	2.000	2.000	0.250	1.124	7
2880 (6063-T6)	2.250	5.250	0.125	1.106	14

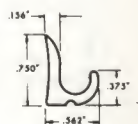
\*Long leg is .062" thick; short leg is .081" thick.

### BELT MOLDING 510



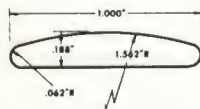
EST. WT. PER FT.—212 LB.  
FACTOR 12

### DRIP MOLDING 627



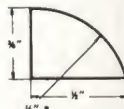
EST. WT. PER FT.—184 LB.  
FACTOR 15

### BELT MOLDING 650



EST. WT. PER FT.—191 LB.  
FACTOR 11

### QUARTER OVAL 661



EST. WT. PER FT.—168 LBS.  
FACTOR 9

# ALUMINUM

SHEET • PLATE  
ROD • SHAPES • WIRE

STAINLESS STEEL

BRASS

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

COPPER

**DRIP MOLDING 668**

EST. WT. PER FT.—.307 LB.  
FACTOR 13

**ZEE 771C**

EST. WT. PER FT.—.938 LB.  
FACTOR 9

**CORNER NOSING 787**

EST. WT. PER FT.—.435 LB.  
FACTOR 8

**CHANNEL 892**

EST. WT. PER FT.—1.667 LB.  
FACTOR 7

**TEES—TAPER STEM AND FLANGES,  
ROUNDED ANGLES, SHARP CORNERS**

Section number	A, inches	B, inches	t, inch	n, inch	m, inch	f-1, inch	Est. weight per foot, pounds	Factor
853-F	1	1	1/4	3/8	3/8	1/4	.320	12
853-B	1 1/2	1 1/4	1/4	3/8	3/8	1/4	.450	12
853-N	1 1/2	1 1/4	3/16	3/8	3/8	1/4	.628	8
853-K	1 1/2	1 1/2	3/16	3/8	3/8	1/4	.700	7
853-G	1 1/2	1 1/2	1/4	3/8	3/8	1/4	.890	6

**TEES—SHARP ANGLES,  
SHARP CORNERS**

Section number	A, inches	B, inches	t-1, inches	t-2, inches	Est. weight per foot, pounds	Factor
18307	3/4	3/4	1/4	1/4	.206	15
4716	3/4	1 1/4	1/4	1/4	.280	14
7030	3/4	1 1/4	3/8	3/8	.328	13
1257	1	1 1/2	1/4	3/4	.319	9
18308	1	3/4	1/4	1/4	.244	14
25055	1	1	1/4	1/4	.281	14
5951	1 1/4	3/4	1/4	1/4	.300	14
18906	2	3/4	1/4	1/4	.394	14



# ALUMINUM

ALUMINUM

YOU  
SER  
YOU  
MET

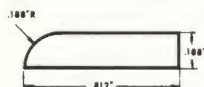
NEW  
WOrt  
P. O.  
  
CART  
P. O.  
Milik  
YOrkt  
Dir. D  
TWX-

HARR  
1000 S  
Humb  
Dir. D  
TWX-

CAMB  
281 Al  
TRow  
Dir. D  
TWX-61

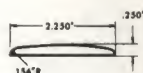
PHILAD  
1955 W. I  
Baldwin  
Dir. Dist.  
TWX-215

BELT MOLDING 1001



EST. WT. PER FT.—.174 LB.  
FACTOR 11

BELT MOLDING 1122



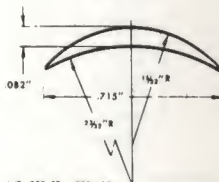
EST. WT. PER FT.—.350 LB.  
FACTOR 9

COUNTER EDGE 1445



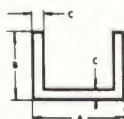
EST. WT. PER FT.—.093 LBS.  
FACTOR 31

CRESCENT 1843



EST. WT. PER FT.—.050 LBS.  
FACTOR 27

CHANNELS, SHARP CORNERS



Section number	A inches	B inches	C inches	Est. weight per foot, pounds	Factor
2335	0.500	0.375	0.125	0.150	15
2749	0.500	0.500	0.094	0.148	19
8997	0.500	0.750	0.125	0.263	14
4533	0.625	0.625	0.125	0.244	14
2715	0.750	0.375	0.125	0.187	15
3547	0.750	0.750	0.125	0.300	14
1940	1.000	0.500	0.125	0.263	14
7484	1.000	1.000	0.125	0.413	14
4286	1.250	0.500	0.125	0.300	14
87071	1.250	0.750	0.125	0.374	14
4542	1.250	1.250	0.125	0.526	14
113507	1.438	0.500	0.094	0.251	19
4300	1.500	0.500	0.125	0.337	14
8449	1.750	0.500	0.125	0.374	14
2105	1.750	0.750	0.125	0.450	14
5714	1.750	1.000	0.125	0.524	14
2388	2.000	0.500	0.125	0.413	14
5527	2.000	1.000	0.125	0.564	14
22266	2.100	0.550	0.100	0.360	17
2748	2.250	0.875	0.125	0.563	14
40517 (6062-T6)	2.500	1.500	0.125	0.787	14
6594	3.000	0.500	0.125	0.563	14
3776	3.000	1.000	0.125	0.713	14
17146	5.000	2.000	0.188	1.940	9

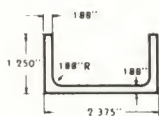
②20 ft. lengths.

②22 ft. lengths.

# ALUMINUM

CHANNEL

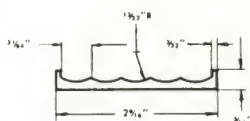
2296



EST. WT. PER FT.—1.031 LB.  
FACTOR 9

PILASTER

2372



EST. WT. PER FT.—.473 LBS.  
FACTOR 13

PILASTER

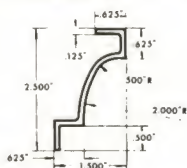
3164



EST. WT. PER FT.—.902 LBS.  
FACTOR 11

CORNER TRIM

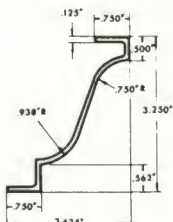
3513



EST. WT. PER FT.—.596 LB.  
FACTOR 14

CORNER TRIM

3514



EST. WT. PER FT.—.830 LB.  
FACTOR 13

TRIM

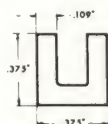
3616



EST. WT. PER FT.—1.181 LB.  
FACTOR 12

CHANNEL

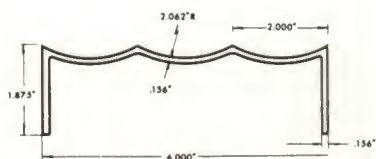
3619



EST. WT. PER FT.—.120 LB.  
FACTOR 17

PILASTER

3636



EST. WT. PER FT.—1.816 LB.  
FACTOR 11

STAINLESS STEEL

BRASS

COPPER

SHEET • PLATE ROD • SHAPES • WIRE

MONEL-NICKEL

CONCRETE WELDING BRAZING PRODUCTS

# ALUMINUM

ALUMINUM

YOU  
SERV  
YOU  
META

NEW  
Worth  
P. O. B  
CART  
P. O. B  
Milik S  
YOrkto  
Dir. D  
TWX-2

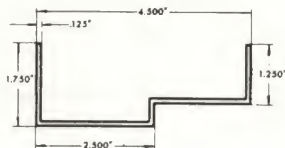
HARR  
1000 S  
Humb  
Dir. D  
TWX-2

CAMB  
281 Al  
TRow  
Dir. Dis  
TWX-61

PHILAD  
1955 W.  
Baldwin  
Dir. Dist  
TWX-21

DOOR FRAME

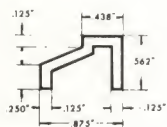
3728



EST. WT. PER FT.—1.163 LB.  
FACTOR 14

GLASS STOP

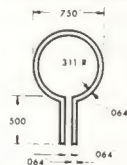
4308



EST. WT. PER FT.—.248 LB.  
FACTOR 15

SEMI-HOLLOW TRIM  
or  
PANEL EDGING

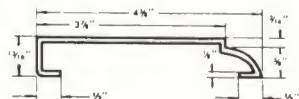
4477



EST. WT. PER FT.—.228 LB.  
FACTOR 26 SEMI-HOLLOW

BASE MOLD

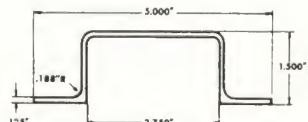
4490



EST. WT. PER FT.—.934 LB.  
FACTOR 14

RUB RAIL

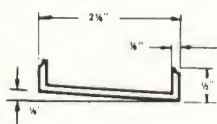
4619



EST. WT. PER FT.—1.137 LB.  
FACTOR 13

DOOR FRAME

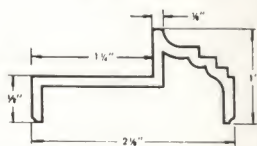
5389



EST. WT. PER FT.—.431 LB.  
FACTOR—14

GLASS FRAME

5390



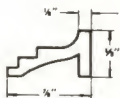
EST. WT. PER FT.—.528 LB.  
FACTOR 14



# ALUMINUM

GLASS FRAME

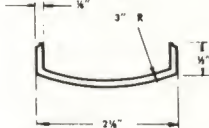
5391



EST. WT. PER FT.—209 LBS.  
FACTOR 14

DOOR FRAME

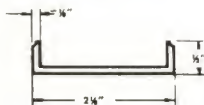
5392



EST. WT. PER FT.—438 LBS.  
FACTOR—14

DOOR FRAME

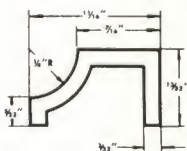
5393



EST. WT. PER FT.—431 LBS.  
FACTOR—14

GLASS FRAME

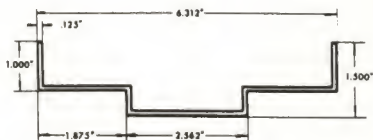
6474



EST. WT. PER FT.—135 LBS.  
FACTOR 19

DOOR FRAME

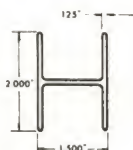
6498



EST. WT. PER FT.—1,359 LB.  
FACTOR 14

H BEAM

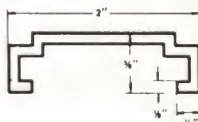
6699



EST. WT. PER FT.—788 LB.  
FACTOR 13

COLUMN POST

6801

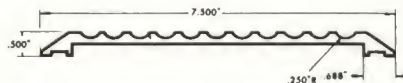


EST. WT. PER FT.—488 LBS.  
FACTOR 14

TYPE W

THRESHOLD

7032



EST. WT. PER FT.—1,798 LB.  
FACTOR 10

STAINLESS STEEL

BRASS

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

# ALUMINUM

NEW  
WOrt  
P. O.

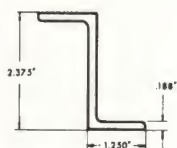
**CART**  
P. O.  
Milik  
YOrk  
Dir. I  
TWN

HAR  
1000 S  
HUm  
Dir. I  
TWN

CAM  
281 A  
TRow  
Dir. Dr  
TWX-6

**PHILADELPHIA**  
1955 W.  
BALDWIN  
Dir. Dis  
TWX-2

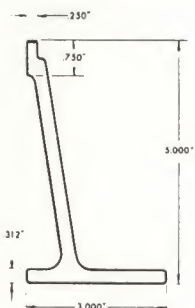
7088



EST. WT. PER FT.—1.022 LB.  
FACTOR 9

## Vault Molding

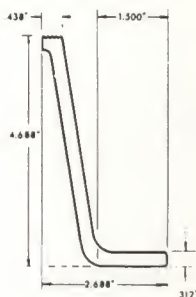
7499



EST. WT. PER FT 2952 LB  
FACTOR 9

## Vault Molding

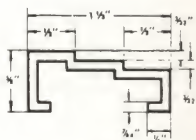
7498



EST. WT. PER FT.—2.388 LB  
FACTOR 6

TRIM

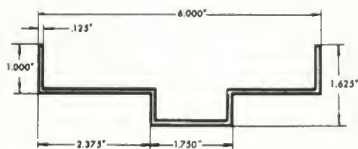
8321



EST. WT. PER FT.—.365 LBS  
FACTOR 16

DOOR FRAME

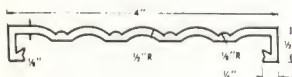
7648



EST. WT. PER FT.—1,350 LB.  
FACTOR 14

## PILASTER

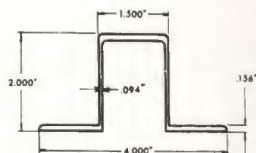
8467



EST. WT. PER FT.—.806 LBS.  
FACTOR 13

SIDE POST

8604

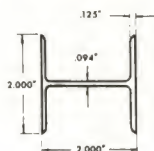


EST. WT. PER FT.—1.163 LB  
FACTOR 13

# ALUMINUM

ROOF BOW

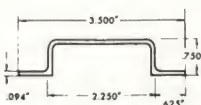
8606



EST. WT. PER FT.—.797 LB.  
FACTOR 14

CHANNEL

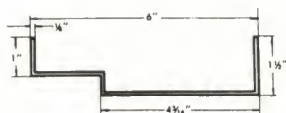
9004



EST. WT. PER FT.—.533 LB.  
FACTOR 17

DOOR FRAME

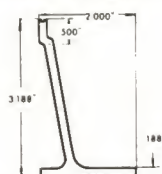
8792



EST. WT. PER FT.—1.313 LBS.  
FACTOR 14

VAULT MOLDING

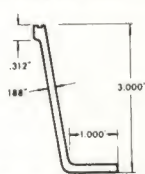
9418



EST. WT. PER FT.—1.181 LB.  
FACTOR 11

VAULT MOLDING

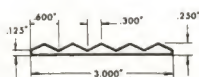
9419



EST. WT. PER FT.—.925 LB.  
FACTOR 9

TRIM

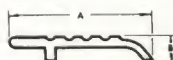
9553



EST. WT. PER FT.—.674 LB.  
FACTOR 10

THRESHOLDS

TYPE F



Section  
number

A

B

Est. weight  
per foot, pounds

Factor

10346

1 1/4

1 7/8

.180

16

38653

1 3/8

1 7/8

.194

18

10347

1 1/2

1 7/8

.232

16

38654

1 5/8

1 7/8

.224

18

STAINLESS STEEL

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

BRASS

COPPER

FOUNDRY • WELDING  
BRAZING PRODUCTS



# ALUMINUM

ALUMINUM

NEW  
Worth  
P. O. I  
CART  
P. O. I  
Milik S  
Yorkt  
Dir. D  
TWX-



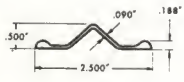
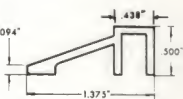
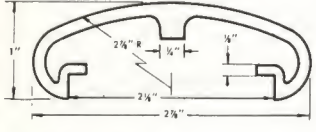
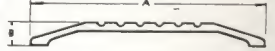
NEW  
Worth  
P. O. I

CART  
P. O. I  
Milik S  
Yorkt  
Dir. D  
TWX-

HARR  
1000 S  
HUMB  
Dir. D  
TWX-

CAME  
281 Al  
TRow  
Dir. Dis  
TWX-61

PHILAD  
1955 W. I  
Baldwin  
Dir. Dist  
TWX-21

SADDLES TYPE C				
				
Section number	A	B	Est. weight per foot, pounds	Factor
10351	3	1/4	.476	13
10352	4 3/4	1/2	.894	10
THRESHOLDS TYPE D				
				
Section number	A	B	Est. weight per foot, pounds	Factor
10353	3 1/2	3/4	.595	15
38649	4 1/4	3/4	.689	15
SLAT 10758			GLASS STOP 12919	
				
EST. WT. PER FT.—.369 LB. FACTOR 16			EST. WT. PER FT.—.274 LB. FACTOR 17	
HANDRAIL 16505			THRESHOLDS AND SADDLES TYPE B	
				
EST. WT. PER FT.—.852 LBS. FACTOR—12				
Section number	A	B	Est. weight per foot, pounds	Factor
38651	3	1/2	.721	10
19047	4	1/2	.829	11
19048	5	1/2	1.102	10
19049	6	1/2	1.226	11
26638	7	1/2	1.777	9

# ALUMINUM

SHEET • PLATE ROD • SHAPES • WIRE

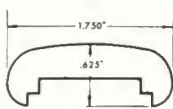
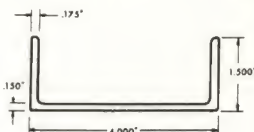
STAINLESS STEEL


BRASS

MONEL-NICKEL

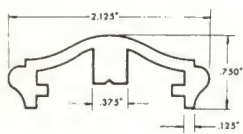
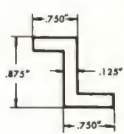
FOUNDRY • WELDING  
BRAZING PRODUCTS

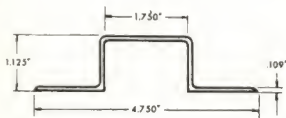
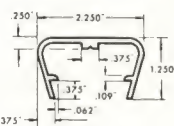
COPPER

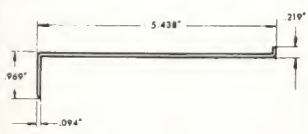
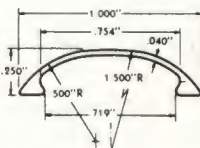
HANDRAIL 20609		CHANNEL 22819	
			
EST. WT. PER FT.—.770 LB. FACTOR 6		EST. WT. PER FT.—1.286 LB. FACTOR 10	

THRESHOLDS		TYPE E	
			

Section number	A	B	Est. weight per foot, pounds	Factor
20999	3½	7⁄8	661	17
38658	4¼	7⁄8	760	16

HANDRAIL 23681		ZEE 23787	
			
EST. WT. PER FT.—.690 LB. FACTOR 10		EST. WT. PER FT.—.319 LB. FACTOR 14	

SIDE POST 24531		HANDRAIL 25300	
			
EST. WT. PER FT.—.898 LB. FACTOR 15		EST. WT. PER FT.—.677 LB. FACTOR 15	

WINDOW STOOL 26593		SNAPMOLD 26936	
			
EST. WT. PER FT.—.720 LB. FACTOR 18		EST. WT. PER FT.—.064 LB. FACTOR 36	

# ALUMINUM

PHILADELPHIA  
1955 W.  
BALDWIN  
Dir. Dis  
TWX-2

Section number	A	B	C	D	E	F	Est. weight per foot, pounds	Factor
37734	3.437	3.000	0.094	1.562	0.188	0.188	0.524	18
37735	3.937	3.500	0.094	1.594	0.219	0.188	0.574	18
37736	4.437	4.000	0.094	1.625	0.250	0.188	0.636	18
37737	4.937	4.500	0.094	1.656	0.281	0.188	0.691	18
37738	5.437	5.000	0.094	1.687	0.312	0.188	0.746	18
37739	5.937	5.500	0.094	1.719	0.344	0.188	0.804	18



## 73

# ALUMINUM

ALUMINUM

YOU  
SERV  
YOU  
MET

NEW  
Worth  
P. O. 1

CART  
P. O. 1  
Milik  
YOrkt  
Dir. D  
TWX-3

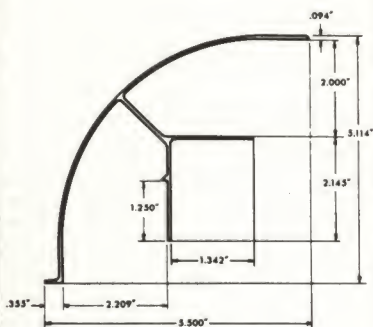
HARR  
1000 S  
HUmbr  
Dir. D  
TWX-3

CAME  
281 Al  
TRow  
Dir. Dis  
TWX-61

PHILAD  
1955 W.  
Baldwin  
Dir. Dist  
TWX-21

ROOF RAIL

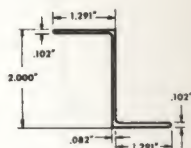
45874



EST. WT. PER FT.—1.566 LB.  
FACTOR 17

SIDE POST

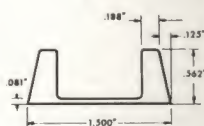
45876



EST. WT. PER FT.—.498 LB.  
FACTOR 18

RUB RAIL

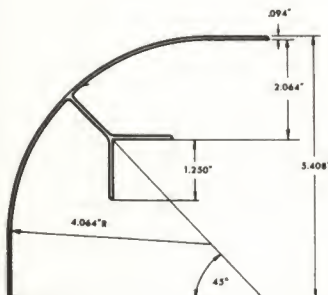
45877



EST. WT. PER FT.—.424 LB.  
FACTOR 11

CORNER POST

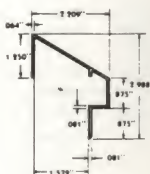
45875



EST. WT. PER FT.—1.392 LB.  
FACTOR 18

LINTEL

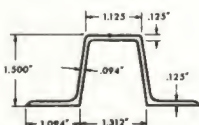
45878



EST. WT. PER FT.—.517 LB.  
FACTOR —23

SIDE POST

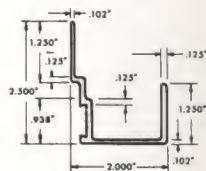
54603



EST. WT. PER FT.—.784 LB.  
FACTOR 15

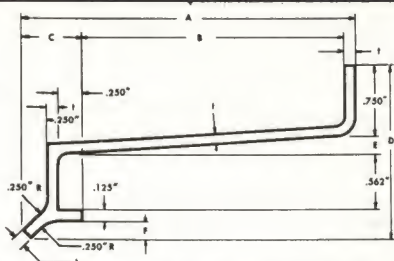
DOOR POST

45879



EST. WT. PER FT.—.760 LB.  
FACTOR 15

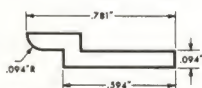
WINDOW  
SILLS



Section number	A	B	C	D	E	F	t	Weight per foot	Factor
54684	3.500	2.750	0.625	1.812	0.188	0.188	0.125	0.767	13
54685	4.000	3.250	0.625	1.844	0.219	0.188	0.125	0.842	13
54686	4.500	3.750	0.625	1.875	0.250	0.188	0.125	0.919	13
54687	5.000	4.250	0.625	1.906	0.281	0.188	0.125	0.994	13
54688	5.500	4.750	0.625	1.938	0.312	0.188	0.125	1.067	13
54689	6.000	5.250	0.625	1.969	0.344	0.188	0.125	1.141	13
54690	6.562	5.750	0.625	2.000	0.375	0.188	0.156	1.529	11
54691	7.562	6.750	0.625	2.062	0.438	0.188	0.156	1.716	11
54692	8.125	7.250	0.688	2.156	0.469	0.250	0.188	2.189	9
54693	9.125	8.250	0.688	2.219	0.531	0.250	0.188	2.414	9

END STOP

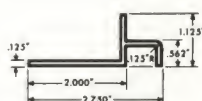
58219



EST. WT. PER FT.—.096 LB.  
FACTOR 30

PLASTER STOP

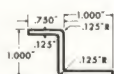
58221



EST. WT. PER FT.—.624 LB.  
FACTOR 14

ANCHOR

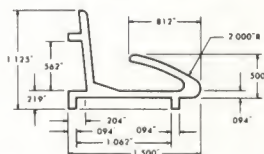
58222



EST. WT. PER FT.—.385 LB.  
FACTOR 14

PICTURE MOLD

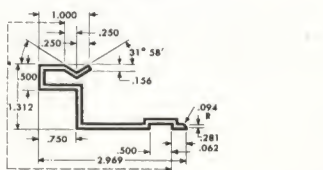
58229



EST. WT. PER FT.—.437  
FACTOR 16

CORNER TRIM

58391



EST. PERIMETER—10.888 IN.  
EST. WT. PER FT.—.604 LBS.  
FACTOR—18

STAINLESS STEEL

BRASS

COPPER

SHEET • PLATE ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS



# ALUMINUM

**YOU  
SERV  
YOU  
MET**

**NEW**  
WOrth  
P. O. F

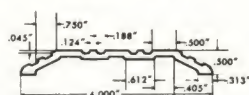
**CART**  
P. O. E  
Milik S  
YOrkte  
Dir. D  
TWX-

HARR  
1000 S  
HUmbr  
Dir. D  
TWX-

**CAMB**  
281 All  
TRowb  
Dir. Dis  
TWX-617

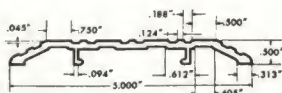
**PHILADELPHIA**  
1955 W. I.  
Baldwin  
Dir. Dist.  
TWX-215

60585



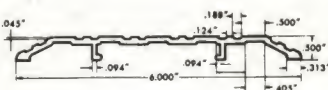
INST. WT. PER FT.—740 LB.  
FACTOR 13

60586



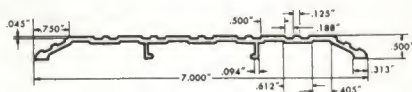
EST. WT. PER FT.—1.014 LB.  
FACTOR 13

60587



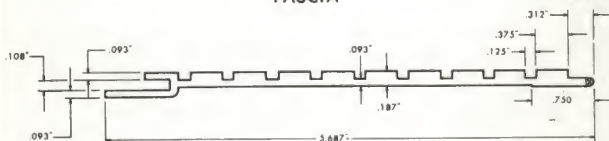
EST. WT. PER FT.—1.183 LB.  
FACTOR 13

60588



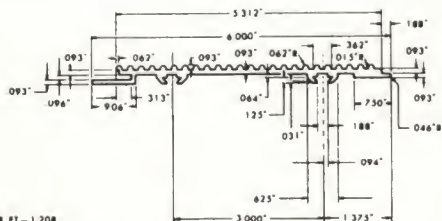
EST. WT. PER FT.—1.352 LB.  
FACTOR 13

64076



EST. WT. PER FT.—1.060 LB.  
FACTOR 13

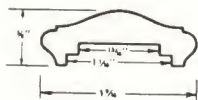
64897



EST WT PER FT - 1208  
FACTOR 15

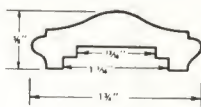
# ALUMINUM

HANDRAIL 66293



EST. WT. PER FT. — 614 LBS.  
FACTOR 7

HANDRAIL 66294



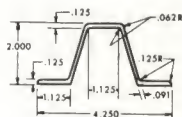
EST. WT. PER FT. — 716 LBS.  
FACTOR 6

HANDRAIL 66295



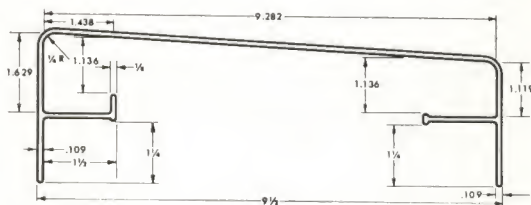
EST. WT. PER FT. — 835 LBS.  
FACTOR 6

COPING 66582



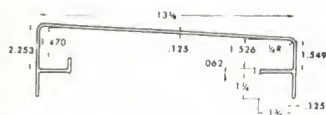
EST. WT. PER FT. — 923  
FACTOR 16

COPING G-8 66611



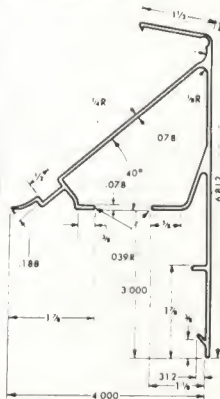
EST. WT. PER FT. — 2,412 LBS.  
FACTOR 15

COPING G-12 69177



EST. WT. PER FT. — 3,702 LBS.  
FACTOR 13

GRAVEL STOP 68755



EST. WT. PER FT. — 1,606  
FACTOR — 20

STAINLESS STEEL

BRASS

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

WEIGHTS

DATA  
FOUNDRY • WELDING  
BRAZING PRODUCTS

# ALUMINUM

ALUMINUM

YOU  
SERV  
YOU  
METAL

NEW  
Worthy  
P. O. E

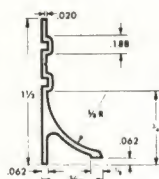
CART  
P. O. E  
Milik S  
YOrkto  
Dir. D  
TWX-3

HARR  
1000 S  
HUMB  
Dir. D  
TWX-3

CAMB  
281 Al  
TRowh  
Dir. D  
TWX-61

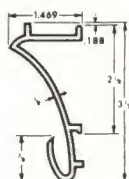
PHILAD  
1955 W.  
BALDWIN  
Dir. Dist  
TWX-21

DRIP MOLD 70421



EST. WT. PER FT. — .194 LBS.  
FACTOR 24

PICTURE MOLD 70422



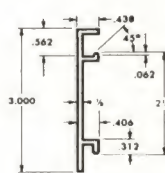
EST. WT. PER FT. — .947 LBS.  
FACTOR 14

PICTURE MOLD 70423



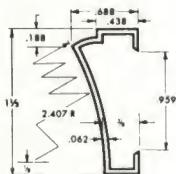
EST. PERIMETER — 11.317 IN.  
EST. WT. PER FT. — .802 LBS.  
FACTOR 14

BASE MOLD 70424



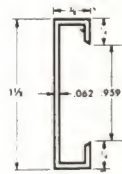
EST. WT. PER FT. — .613 LBS.  
FACTOR 14

WALL TRIM 70425



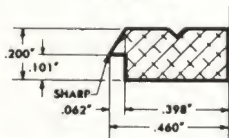
EST. WT. PER FT. — .209 LBS.  
FACTOR 28

TRIM 70426



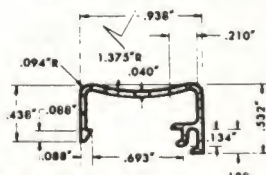
EST. WT. PER FT. — .186 LBS.  
FACTOR 28

END STOP ANCHOR 77563



EST. WT. PER FT. — .098 LB  
FACTOR 13

FASCIA END STOP 77564

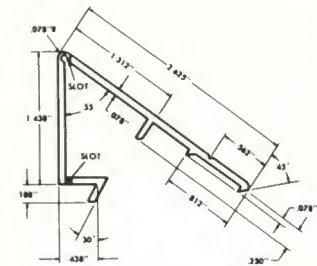


EST. WT. PER FT. — .106 LB  
FACTOR 41



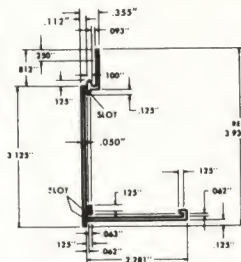
# ALUMINUM

FLASHING CAP 79587



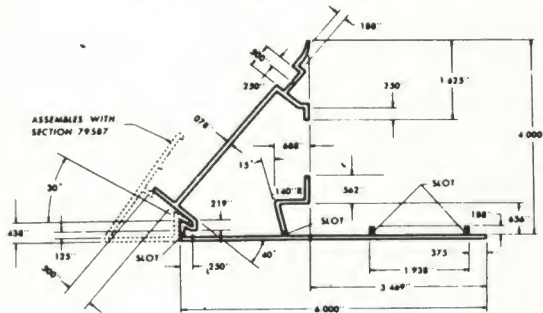
EST. WT. PER FT. — 448 LB.

SOFFIT TRIM 79590



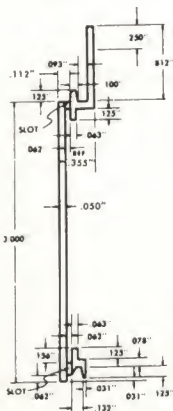
EST. WT. PER FT. — 442 LB.  
FACTOR — 32

TYPE EE GRAVEL STOP 79588



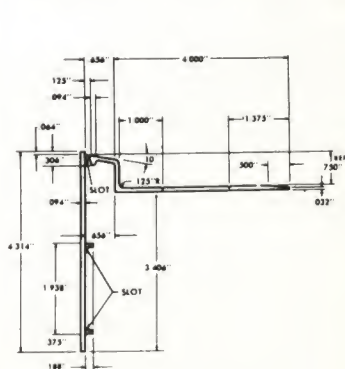
EST. WT. PER FT. — 1,387 LB.

FASCIA 79589



EST. WT. PER FT. — 316 LB.

TYPE FF GRAVEL STOP 79591



EST. WT. PER FT. — 1,126 LB.

STAINLESS STEEL

BRASS

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

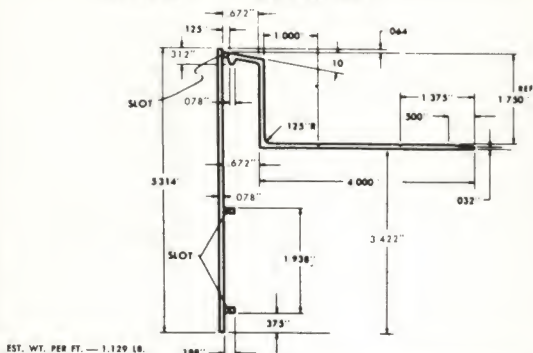
MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

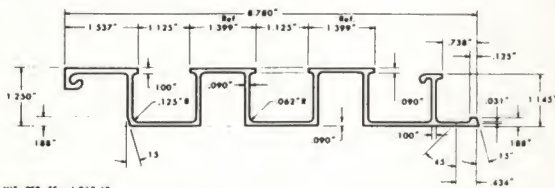
# ALUMINUM

PHILA  
1955 W  
Baldwi  
Dir. Dis  
TWX-2

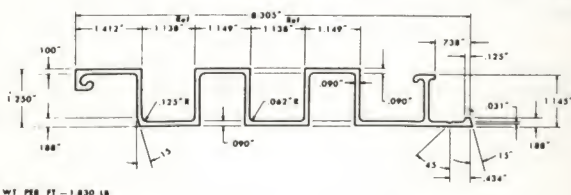
79592



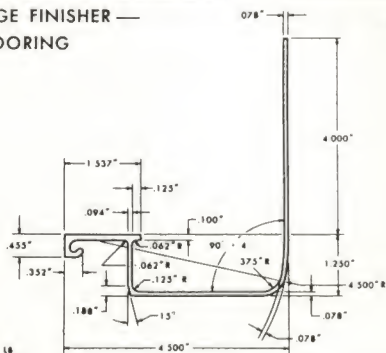
79800



79801

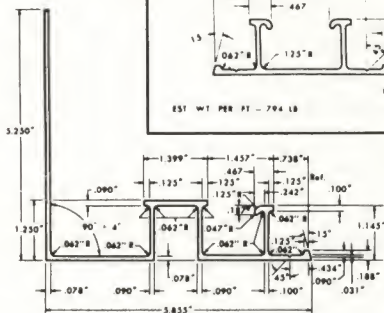


79802



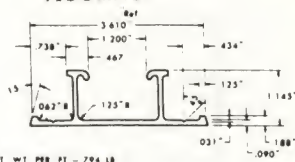
# ALUMINUM

EDGE STARTER — 79803  
FLOORING



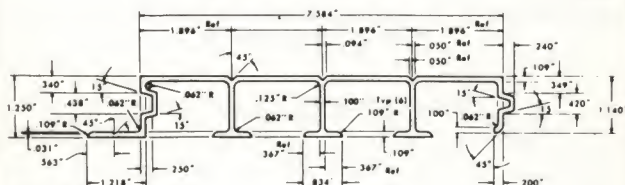
EST. WT. PER FT. — 1.560 LB.  
CIRCLE SIZE — 7.9

CENTER STARTER — 79804  
FLOORING



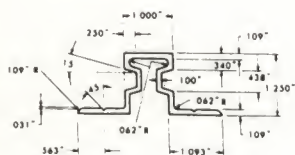
EST. WT. PER FT. — 7.94 LB.

DRY FREIGHT FLOORING 79805



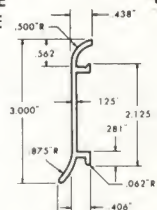
EST. WT. PER FT. — 2.176 LB.

CENTER STARTER — 79806  
FLOORING



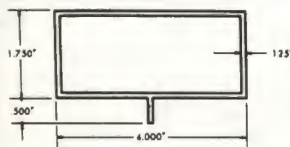
EST. WT. PER FT. — 7.52 LB.

COVE BASE 84701



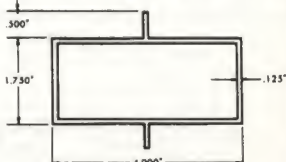
EST. WT. PER FT. — 5.90 LB.  
FACTOR 14

MULLION OR FRAME 79840



EST. WT. PER FT. — 1.437  
FACTOR 12

MULLION OR FRAME 79841



EST. WT. PER FT. — 1.800  
FACTOR 13

STAINLESS STEEL

BRASS

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

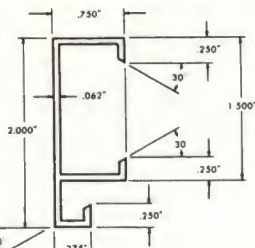
MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS



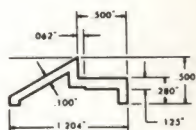
# ALUMINUM

MULTIPURPOSE TRIM 84702



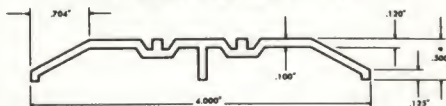
EST. WT. PER FT.—312 LB.  
FACTOR 27

THRESHOLD  
MITER STRIP 84781



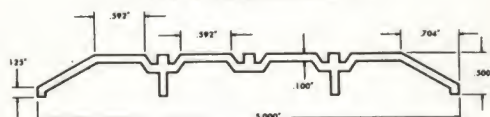
EST. WT. PER FT.—211  
FACTOR 17

TYPE H THRESHOLD — 4" 84782



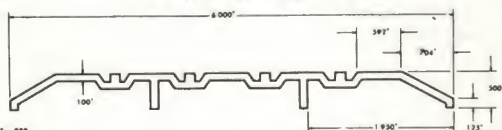
EST. WT. PER FT.—430  
FACTOR 17

TYPE H THRESHOLD — 5" 84783



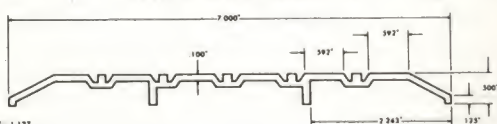
EST. WT. PER FT.—804  
FACTOR 17

TYPE H THRESHOLD — 6" 84784



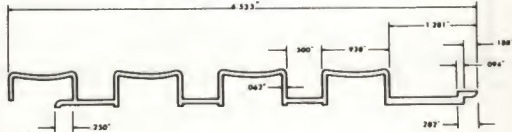
EST. WT. PER FT.—988  
FACTOR 17

TYPE H THRESHOLD — 7" 84785



EST. WT. PER FT.—1127  
FACTOR 16

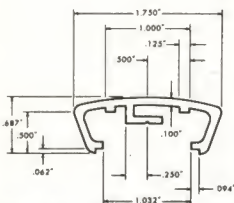
FASCIA 87066



EST. WT. PER FT.—820  
FACTOR 23

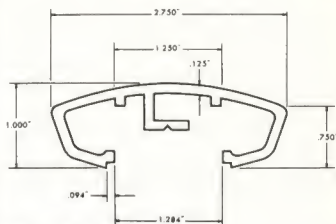
# ALUMINUM

HANDRAIL 87067



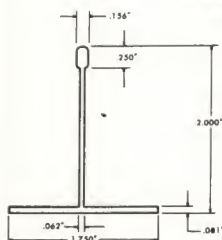
EST. WT. PER FT.—.446 LB.  
FACTOR 16

HANDRAIL 87068



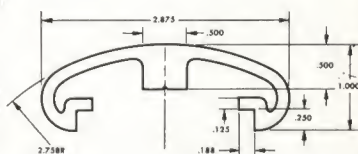
EST. WT. PER FT.—.871 LB.  
FACTOR 14

TEE 87069



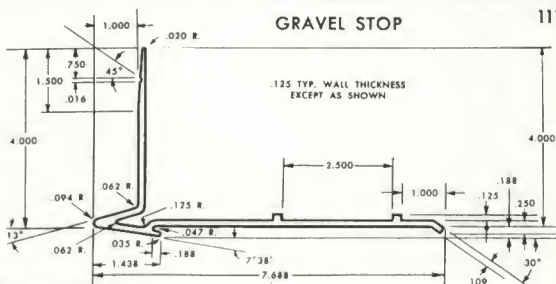
EST. WT. PER FT.—.341 LB.  
FACTOR 22

HANDRAIL 90503



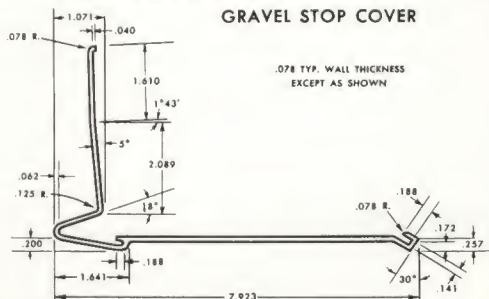
EST. WT. PER FT.—.980 LB.  
FACTOR 11

GRAVEL STOP 111291



EST. WT. PER FT.—1.853 LB.

GRAVEL STOP COVER 111301



EST. WT. PER FT.—1.259 LB.

# ALUMINUM

ALUMINUM

YOU  
SER  
YOU  
MET

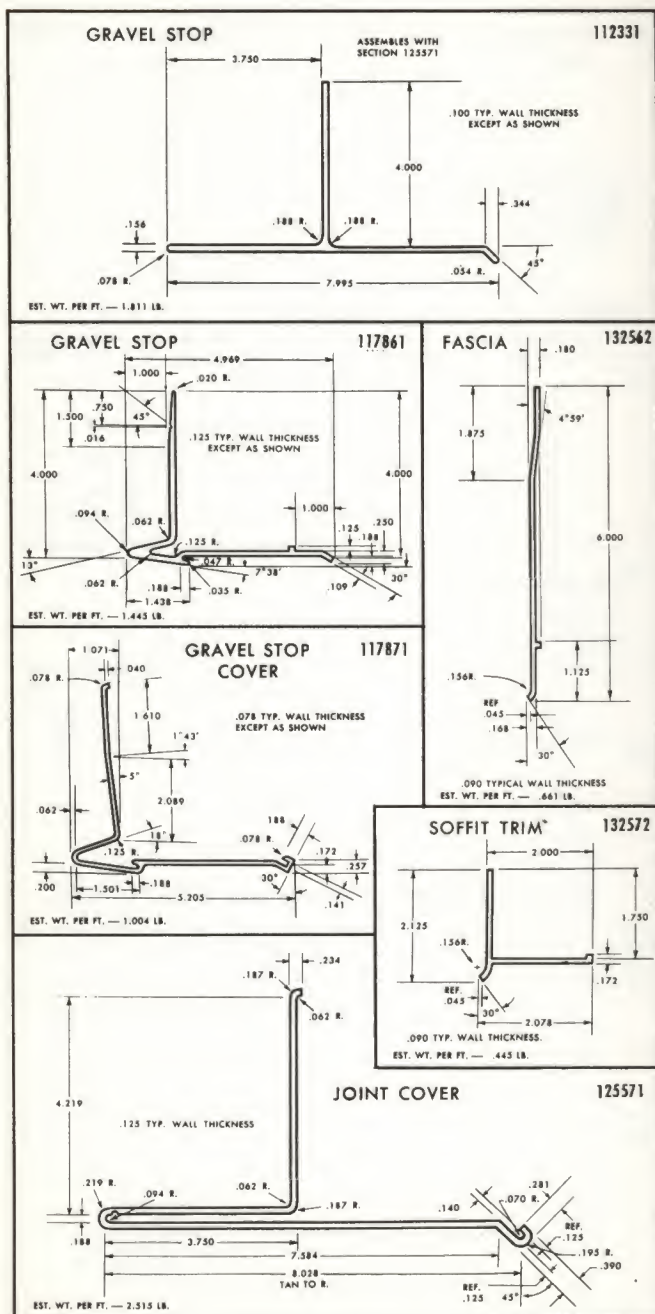
NEW  
WORTH  
P. O.

CART  
P. O.  
Milik  
YOrkt  
Dir. D  
TWX-

HARF  
1000 S  
HUmh  
Dir. D  
TWX-

CAME  
281 Al  
TRow  
Dir. D  
TWX-61

PHILAD  
1955 W.  
Baldwin  
Dir. Dist  
TWX-21





# ALUMINUM

<p>HANDRAIL BRACKET 301-B</p>	<p>HANDRAIL BRACKET 302-B</p>
<p>HANDRAIL BRACKET 303-B (16505-B)</p>	<p>CHANNEL SCROLL 16505-C</p>
<p>SCROLL (LEFT OR RIGHT) 16505-S</p>	<p>TERMINAL END 16505-E</p>
	<p>CHANNEL SCROLL 20609-C</p>
<p>LAMBS TONGUE 20609-L</p>	<p>TERMINAL END 20609-E</p>
	<p>CHANNEL SCROLL 66294-C</p>
<p>SCROLL (LEFT OR RIGHT) 20609-S</p>	<p>TERMINAL END 66294-E</p>

STAINLESS STEEL

BRASS

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

WEIGHTS

FOUNDRY • WELDING  
BRAZING PRODUCTS

# ALUMINUM

ALUMINUM

YOU  
SERV  
YOU  
MET

NEW  
Worth  
P. O. E

CART  
P. O. E  
Milik S  
YOrkt  
Dir. D  
TWX-

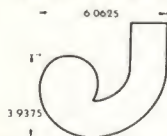
HARR  
1000 S  
HUmbr  
Dir. D  
TWX-

CAME  
281 Al  
TRow  
Dir. D  
TWX-61

PHILAD  
1955 W.  
Baldwin  
Dir. Dis  
TWX-21

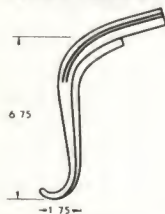
SCROLL  
(LEFT OR RIGHT)

66294-S



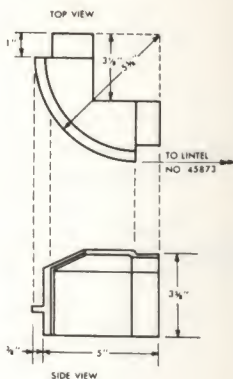
LAMBS TONGUE

66294-L



LINTEL CORNER  
CASTING

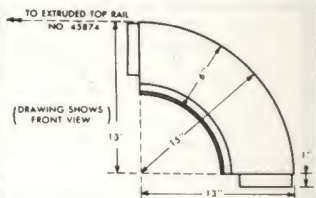
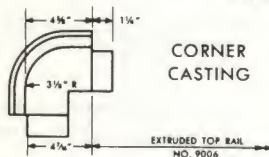
45873



16B-48

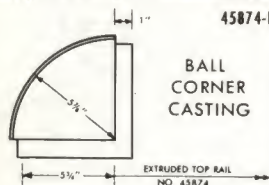
CORNER CASTING

45874-R



45874-B

BALL  
CORNER  
CASTING



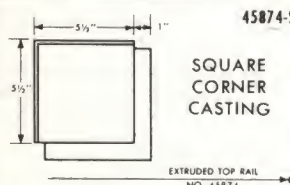
SC-201  
SNAP-ON CLIP  
For 70422  
70423  
70424  
84701

SC-202  
SNAP-ON CLIP  
8321  
for 70425  
70426



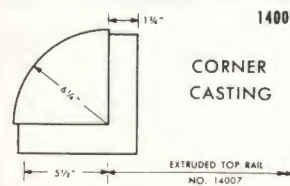
45874-S

SQUARE  
CORNER  
CASTING



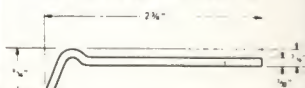
14007

CORNER  
CASTING



WINDOW SILL  
ANCHOR CLIP  
for 54684 thru 54693

SA-100



# WHAT DO YOU WANT TO KNOW ABOUT **BRASS**

Complete information, including the latest technical developments made by the engineering and research departments of the Anaconda American Brass Company is available to you free of charge. Some of this literature is listed on the next page.

If at any time you have problems about brass, call our nearest warehouse sales office for help.



**INDUSTRIAL PRODUCTS**

ROD • SHAPES • WIRE

**WEIGHTS**

**MONEL-NICKEL**

**FOUNDRY • WELDING  
BRAZING PRODUCTS**

**STAINLESS STEEL**

SHEET • PLATE

ROD • BAR

**BRASS**

**COPPER**



Angles & Channels .....	112-114
Architectural Bronze	
Rod .....	102, 103
Angle & Channel .....	113, 114
Bar & Rod .....	95-104
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Coiled Sheet & Strip .....	88, 89
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Wire .....	105

# BRASS

Stocks change from time to time. If the material you want is not listed here, call or write our office nearest you for additional information.

## LITERATURE ON BRASS

Here are a few of the booklets published by the Anaconda American Brass Company that are available to you. This literature is free, and may be had by calling our representative, or writing our nearest warehouse sales office.

### Anaconda Copper and Copper Alloys

Data for the user of Copper & Copper Alloys

Copper & Copper Alloy Metalexicon

PRACTICAL SUGGESTIONS for Machining Copper, Brass Bronze and Nickel Silver

Tubes and Plates for Condensers and Heat Exchangers

Copper for Electrical Conductors

Rods for Screw Machine Products

Welding Rods and Procedures for Welding Copper and Copper Alloys

Copper Tubes and Fittings

Anaconda through-wall flashing

Extruded Architectural Bronze Thresholds

EVERDUR Alloys, Physical Properties and Applications

EVERDUR Electrical Conduit

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 Baltimore, Md. ....Windsor 4-2000  
 Buffalo, N. Y. ....TRiangle 6-3100  
 Syracuse, N. Y. ....HOrward 3-6241  
 Windsor, Conn. ....phone 688-4921  
 Rochester, N. Y. ....BUtler 8-2141

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

BRAZING PRODUCTS

SHEET • PLATE

ROD • BAR

TUBING • PIPE  
• SHAPESHYDRAULIC TUBING  
STEEL

STAINLESS STEEL

COPPER

# BRASS SHEET WEIGHT TABLE

Pounds per  
Square Foot

YELLOW BRASS  
OLD ALLOY NO. 42  
NEW ALLOY NO. 260

Thickness (in inches)	B & S Gauge	Pounds per Sq. Ft.	Thickness (in inches)	B & S Gauge	Pounds per Sq. Ft.
1.000	—	44.35	.0571	15	2.532
.875	—	38.81	.0508	16	2.253
.750	—	33.26	.0453	17	2.009
.625	—	27.72	.0403	18	1.787
.500	—	22.18	.0359	19	1.592
.4600	4/0	20.40	.0320	20	1.419
.4096	3/0	18.17	.0285	21	1.264
.375	—	16.63	.0254	22	1.122
.3648	2/0	16.18	.0226	23	1.002
.3249	1/0	14.41	.0201	24	.8915
.3125	—	13.86	.0179	25	.7939
.2893	1	12.83	.0159	26	.7052
.2576	2	11.43	.0142	27	.6298
.250	—	11.09	.0126	28	.5588
.2294	3	10.17	.0113	29	.5012
.2043	4	9.061	.0100	30	.4435
.1875	—	8.316	.0089	31	.3947
.1819	5	8.068	.0080	32	.3548
.1620	6	7.185	.0071	33	.3149
.1443	7	6.400	.0063	34	.2794
.1285	8	5.699	.0056	35	.2484
.125	—	5.544	.0050	36	.2218
.1144	9	5.074	.0045	37	.1996
.1019	10	4.519	.0040	38	.1774
.0907	11	4.023	.0035	39	.1552
.0808	12	3.584	.0031	40	.1375
.0720	13	3.193	.0028	41	.1242
.0641	14	2.843	.0025	42	.1109

## WEIGHT CONVERSION FACTORS

for Use With Above Table

Alloy	Alloy No.	Conversion Factor	Alloy	Alloy No.	Conversion Factor
MUNTZ METAL	66	0.9870	TOBIN BRONZE	450	
CLOCK BRASS	OLD: 246 NEW: 3532	0.9903	AND NAVAL BRASS	452	0.9870
GRADE A PHOSPHOR BRONZE	OLD: 351 NEW: 510	1.0389	MANGANESE BRONZE	937	.09805
COMMERCIAL BRONZE	14	1.039	EVERDUR	1010	1.0000
			ARCHITECTURAL BRONZE	OLD: 280 NEW: 355	1.000

# BRASS

## YELLOW BRASS COILED SHEET — SOFT

Old Alloy No. 42  
New Alloy No. 260

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot	Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.0031	6	.0687	.0254	10	.929
.0050	8	.153		12	1.122
.0063	6	.1397		14	1.31
	8	.185	.0320	6	.705
.0080	12	.3548		8	.940
.0100	12	.4435		10	1.175
.0126	6	.277		12	1.419
	12	.5588		14	1.640
	20*	.925	.0359	10	1.29
.0159	6	.35	.0403	12	1.787
	12	.7052		14	1.92
.0201	6	.443	.0508	8	1.49
	8	.5944		12	2.253
	10	.738	.0641	6	1.41
	12	.8915		10	2.35
	14	1.03		12	2.82
.0254	6	.557		14	3.29
	8	.740			

\* Dead Soft

## YELLOW BRASS COILED SHEET — HALF HARD

Old Alloy No. 42  
New Alloy No. 260

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot	Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.0080	12	.3548	.0254	12	1.122
.0100	12	.4435	.0320	12	1.419
.0126	12	.5588	.0359	12	1.592
.0159	12	.7052	.0403	12	1.787
	14	.817	.0453	12	2.009
.0201	6	.443	.0508	12	2.253
	12	.8915			



# BRASS

## YELLOW BRASS COILED STRIP — SPRING TEMPER

Alloy No. 42  
New Alloy No. 260

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot	Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.0031	6	.0687	.0126	6	.2794
.0040	6	.0889		8	.370
.0063	6	.1397		12	.5588
	8	.185	.0159	8	.477
	12	.2794		12	.7052
.0080	2	.059	.0201	6	.4458
	8	.235		12	.8815
	12	.3548	.0254	12	1.122
.0100	8	.294	.0320	8	.94
	12	.4435	.0403	8	1.18
			.0508	12	2.253

## YELLOW BRASS FLAT STRIP — SPRING TEMPER

Old Alloy No. 42  
New Alloy No. 260

Thickness (in inches)	Size (in inches)	Pounds per Lineal Foot
.0320	12 X 96	1.419
.0403	12 X 96	1.787

## YELLOW BRASS STRIP — SOFT

Old Alloy No. 42  
New Alloy No. 260

Thickness (in inches)	Size (in inches)	Pounds per Lineal Foot	Thickness (in inches)	Size (in inches)	Pounds per Lineal Foot
.0201	12 X 96	.8815	.0641	12 X 96	2.843
.0254	12 X 96	1.122	.0808	12 X 96	3.584
.0320	12 X 96	1.419	.0907	12 X 96	4.023
.0359	12 X 96	1.592	.1019	12 X 96	4.519
.0403	12 X 96	1.787	.1250	12 X 96	5.544
.0508	12 X 96	2.253			

STAINLESS STEEL

ROD • BAR

TUBING • PIPE  
• SHAPES

HYDRAULIC TUBING

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

COPPER

FOUNDRY • WELDING  
BRAZING PRODUCTS

# BRASS

## FORMBRITE BRASS SHEET — HALF HARD

Old Alloy No. 42  
New Alloy No. 260

Thickness (in inches)	Size (in inches)	Pounds per Lineal Foot	Thickness (in inches)	Size (in inches)	Pounds per Lineal Foot
.010	12 X 96	.4435	.0359	12 X 96	1.592
.0126	12 X 96	.5588	.0403	8 X 96	1.184
.0159	10 X 96	.584		10 X 96	1.480
	12 X 96	.7052		12 X 96	1.787
	24 X 96	1.4104		14 X 96	2.072
.0179	12 X 96	.7939		16 X 96	2.368
.0201	8 X 96	.591		24 X 96	3.574
	12 X 96	.8915	.0453	12 X 96	2.009
	14 X 96	1.033		14 X 96	2.328
	18 X 96	1.329	.0508	8 X 96	1.492
	24 X 96	1.783		10 X 96	1.865
.0254	8 X 96	.743		12 X 96	2.253
	12 X 96	1.122		14 X 96	2.612
	14 X 96	1.301		16 X 96	2.984
	18 X 96	1.672		18 X 96	3.358
	24 X 96	2.244		24 X 96	4.506
.0320	6 X 96	.705	.0571	12 X 96	2.532
	8 X 96	.940	.0641	6 X 96	1.412
	10 X 96	1.175		8 X 96	1.88
	12 X 96	1.419		10 X 96	2.35
	14 X 96	1.645		12 X 96	2.825
	16 X 96	1.880		14 X 96	3.296
	18 X 96	2.129		16 X 96	3.76
	24 X 96	2.838		24 X 96	5.686

## YELLOW BRASS STRIP — HALF HARD

Old Alloy No. 42  
New Alloy No. 260

Thickness (in inches)	Size (in inches)	Pounds per Lineal Foot	Thickness (in inches)	Size (in inches)	Pounds per Lineal Foot
.0720	14 X 96	3.71	.1019	12 X 96	4.519
.0808	12 X 96	3.584	.1250	10 X 96	4.59
	16 X 96	4.75		12 X 96	5.544
.0907	12 X 96	4.023		14 X 96	6.43
	24 X 96	8.046		24 X 96	11.088
.093	12 X 96	4.158	.1875	12 X 96	8.316

# BRASS

## YELLOW BRASS SHEET AND STRIP — HALF HARD

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.0320	14 X 96	1.64
.0641	12 X 96	2.83
	14 X 96	3.29
.0907	6 X 96	2.00
	8 X 96	2.66
	10 X 96	3.30
	12 X 96	3.99
	14 X 96	4.66
	24 X 96	7.98
.1250	12 X 96	5.51

Old Alloy No. 59  
New Alloy No. 268

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.1250	14 X 96	6.43
	16 X 96	7.37
.1875	14 X 96	9.64
.2500	14 X 96	12.85
.3750	14 X 96	19.28
.5000	12 X 96	22.03
	14 X 96	25.70
.6250	14 X 96	28.11
	16 X 96	32.13

## YELLOW BRASS SHEET AND STRIP — HALF HARD

Thickness (in inches)	Size (in inches)	Pounds per Lineal Foot
.0508	12 X 96	2.24
.0641	12 X 96	2.83
.0907	6 X 96	2.00
	8 X 96	2.66
	12 X 96	3.99
	14 X 96	4.66
	18 X 96	5.99
.1019	8 X 96	3.00
	14 X 96	5.25
.1250	6 X 96	2.75
	8 X 96	3.67
	10 X 96	4.59
	12 X 96	5.51
	14 X 96	6.43
	16 X 96	7.34
.1562	12 X 96	6.88
.1875	6 X 96	4.13
	8 X 96	5.51
	8 X 120	5.51
	10 X 96	6.88
	12 X 96	8.26
	14 X 96	9.64
.2500	6 X 96	5.51
	8 X 96	7.37
	10 X 96	9.18
	12 X 96	11.02

Extra High Leaded  
Old Alloy No. 238  
New Alloy No. 356

Thickness (in inches)	Size (in inches)	Pounds per Lineal Foot
.2500	14 X 96	12.85
	16 X 96	14.74
	18 X 96	16.52
	24 X 48	22.04
.3125	6 X 96	6.89
	10 X 96	11.48
	12 X 96	13.78
.3750	6 X 96	8.26
	8 X 96	11.02
	12 X 96	16.52
	14 X 96	19.28
	16 X 96	22.04
	18 X 96	24.79
	24 X 48	33.04
.5000	6 X 96*	11.02
	8 X 96*	14.74
	10 X 96*	18.38
	12 X 96*	22.04
	14 X 96*	25.70
	24 X 48*	44.06
.6250	6 X 96*	13.82
	10 X 96*	23.04
	12 X 96	27.64
	14 X 96*	32.25
1.000	24 X 96	88.12

\* Sawed edges

STAINLESS STEEL

ROD • BAR

TUBING • PIPE  
• SHAPES

HYDRAULIC TUBING

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS



# BRASS

## YELLOW BRASS PLATE — HALF HARD

Sawed Edges  
Random Lengths  
Old Alloy No. 246  
New Alloy No. 3532

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.250*	6	5.49
	12	10.98
.3125*	12	13.72
.375*	12	16.46

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.500*	12	21.96
.625	12	27.44
.750	12	32.93
1.000	12	43.91

\*Also furnished sheared.

## NAVAL BRASS HOT ROLLED SHEET AND PLATE

Sheared  
Old Alloy No. 450  
New Alloy No. 464

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.125	36 X 96	131.3
	48 X 120	218.8
.188	36 X 96	197.0
	48 X 96	262.7
	48 X 120	328.4
.250	36 X 96	262.8

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.250	48 X 96	350.4
	48 X 120	438.0
.375	36 X 120	492.3
	48 X 120	656.4
.500	48 X 120	881.2
1.000	48 X 120	1762.4

## NAVAL BRASS COLD ROLLED SHEET AND PLATE

Sheared  
Old Alloy No. 450  
New Alloy No. 464

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.0320	36 X 96	33.6
.0403	36 X 96	42.3
.0508	36 X 96	53.4
.0625	36 X 96	66.1
.0641	36 X 96	67.4

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.0907	36 X 96	95.3
.1250	36 X 96	131.3
.1875	36 X 96	197.0
.250	36 X 96	262.8

# BRASS

## PHOSPHOR BRONZE STRIP

Old Alloy No. 351  
New Alloy No. 510

Thickness (in inches)	Size (in inches)	Pounds per Lineal Foot	Thickness (in inches)	Size (in inches)	Pounds per Lineal Foot
.005	6 X ROLLS	.115	.022	6 X COILS	.500
.006	6 X COILS	.138	.025	6 X COILS	.583
.008	6 X COILS	.184	.032	6 X COILS	.737
.010	6 X COILS	.230		6 X 96 R/L	.737
.012	6 X COILS	.276	.040	6 X COILS	.929
.014	6 X COILS	.322		6 X 96 R/L	.929
.0159	6 X COILS	.366	.051	6 X 96 R/L	1.170
.018	6 X COILS	.405	.064	6 X 96 R/L	1.477
.020	6 X COILS	.461			

## MUNTZ METAL PLATE — HALF HARD

Cold Rolled, Leaded  
Old Alloy No. 274  
New Alloy No. 365

Thickness (in inches)	Size (in inches)	Pounds per Lineal Foot
.250	30 X 96	138.0
1.250	12 X 96	438.0
1.500	12 X 96	535.5

## MUNTZ METAL SHEET COLD ROLLED

Old Alloy No. 66  
New Alloy No. 280

Thickness (in inches)	Size (in inches)	Pounds Per Sheet	Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.032	30 X 96	28.0	.081	24 X 96	56.0
	36 X 96	33.5		36 X 96	85.0
	36 X 120	43.0		36 X 120	109.0
.040	36 X 96	42.2		36 X 144	128.0
	36 X 120	53.5	.091	36 X 96	96.0
.051	36 X 96	53.2	.102	36 X 96	108.0
	36 X 120	67.5	.125	24 X 96	88.0
.062	36 X 96	65.5		24 X 144	132.0
	48 X 120	109.0		30 X 60	69.0
.064	24 X 96	45.0		30 X 96	110.0
	24 X 144	68.0		30 X 144	165.0
	30 X 96	56.5		36 X 96	130.9
	30 X 144	84.75		36 X 144	193.0
	36 X 996	67.1		48 X 120	218.2
	36 X 120	87.0	.188	30 X 60	103.0
	36 X 144	102.0		36 X 96	196.3
	48 X 129	112.9	.250	36 X 96	261.9

STAINLESS STEEL

ROD • BAR

TUBING • PIPE  
• SHAPES

HYDRAULIC TUBING  
STEEL

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

# BRASS

## MUNTZ METAL SHEET HOT ROLLED

Old Alloy No. 66  
New Alloy No. 280

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.250	36 X 96	261.8
	48 X 120	436.4
.500	48 X 120	872.4

## 18% NICKEL SILVER COILED SHEET

Old Alloy No. 719  
New Alloy No. 752

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot	Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.0100	8	.294	.0254	6	.576
.0126	8	.382	.0320	6	.728
.0159	8	.482	.0403	8	1.223
.0201	8	.610	.0508	6	1.156

## 18% NICKEL SILVER COILED STRIP — SPRING TEMPER

Old Alloy No. 724  
New Alloy No. 770

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot	Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.0126	6	.287	.0254	6	.576
.0159	6	.362	.0320	6	.726
.0201	6	.457			

## 18% NICKEL SILVER SHEET — ¼ HARD

Old Alloy No. 719  
New Alloy No. 752

Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot	Thickness (in inches)	Width (in inches)	Pounds per Lineal Foot
.0254	12 X 96	9.25	.0641	12 X 96	23.50
.0320	12 X 96	11.75	.0907	12 X 96	33.00
.0403	12 X 96	14.75	.1250	12 X 96	45.50



# BRASS

## EVERDUR BRONZE SHEET

Alloy No. 1010

Thickness (in inches)	Size (in inches)	Pounds Per Sheet
.0641	36 X 96	57
.0938	30 X 96	85
.1250	30 X 96	111
.1875	30 X 96	167
.2500	30 X 96	222

## RED BRASS COILED SHEET — SOFT

Formerly 85% Rich Low Brass  
Old Alloy No. 24  
New Alloy No. 230

Thickness (in inches)	Size (in inches)	Pounds per Lineal Foot
.0201	12	.91



## FREE CUTTING BRASS ROUND ROD

Old Alloy No. 271  
New Alloy No. 360  
Mill Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{16}$	.0113	$\frac{11}{16}$	1.368	2	11.57
$\frac{3}{32}$	.0254	$\frac{3}{4}$	1.628	$2\frac{1}{16}$	12.31
$\frac{7}{64}$ *	.034	$2\frac{5}{32}$	1.766	$2\frac{1}{8}$	13.07
$\frac{1}{8}$	.0452	$\frac{13}{16}$	1.910	$2\frac{3}{16}$	13.85
$\frac{9}{64}$	.057	$\frac{7}{8}$	2.215	$2\frac{1}{4}$	14.65
$\frac{5}{32}$	.0706	$\frac{15}{16}$	2.543	$2\frac{5}{16}$	15.47
$\frac{3}{16}$	.1017	1	2.893	$2\frac{3}{8}$	16.32
$\frac{7}{32}$	.1385	$1\frac{1}{16}$	3.266	$2\frac{1}{2}$	18.08
$\frac{15}{64}$	.155	$1\frac{1}{8}$	3.662	$2\frac{5}{8}$	19.94
$\frac{1}{4}$	.1808	$1\frac{3}{16}$	4.080	$2\frac{3}{4}$	21.88
$\frac{9}{32}$	.2289	$1\frac{1}{4}$	4.521	$2\frac{7}{8}$	23.93
$\frac{5}{16}$	.2826	$1\frac{5}{16}$	4.984	3	26.04
$\frac{11}{32}$	.3419	$1\frac{3}{8}$	5.470	$3\frac{1}{8}$	28.26
$\frac{3}{8}$	.4069	$1\frac{7}{16}$	5.979	$3\frac{1}{4}$	30.56
$\frac{13}{32}$	.4775	$1\frac{1}{2}$	6.510	$3\frac{1}{2}$	35.44
$\frac{7}{16}$	.5538	$1\frac{9}{16}$	7.064	$3\frac{3}{4}$	40.69
$\frac{15}{32}$	.6358	$1\frac{5}{8}$	7.640	4	46.30
$\frac{1}{2}$	.7234	$1\frac{11}{16}$	8.239	$4\frac{1}{4}$	52.3
$\frac{17}{32}$	.8166	$1\frac{3}{4}$	8.861	$4\frac{1}{2}$	58.59
$\frac{9}{16}$	.9155	$1\frac{13}{16}$	9.505	5 **	72.34
$\frac{19}{32}$	1.020	$1\frac{7}{8}$	10.17	6 **	104.21
$\frac{5}{8}$	1.130	$1\frac{15}{16}$	10.86		

\* 6 Foot Lengths

\*\* 5 Foot Lengths

STAINLESS STEEL

ROD • BAR

TUBING • PIPE  
• SHAPES

HYDRAULIC TUBING  
STEEL

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

# BRASS

## FREE CUTTING BRASS SQUARE BAR

Old Alloy No. 271  
New Alloy No. 360  
Mill Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{3}{32}$	.0324	$\frac{9}{16}$	1.166	$1\frac{1}{8}$	4.663
$\frac{1}{8}$	.0576	$\frac{5}{8}$	1.439	$1\frac{1}{4}$	5.756
$\frac{3}{16}$	.1295	$1\frac{1}{16}$	1.741	$1\frac{3}{8}$	6.965
$\frac{1}{4}$	.2303	$\frac{3}{4}$	2.072	$1\frac{1}{2}$	8.289
$\frac{5}{16}$	.3598	$1\frac{3}{16}$	2.432	$1\frac{3}{4}$	11.28
$\frac{3}{8}$	.5181	$\frac{7}{8}$	2.821	2	14.74
$\frac{7}{16}$	.7051	1	3.684	$2\frac{1}{4}$	18.65
$\frac{1}{2}$	.9210			3	33.16

## FREE CUTTING BRASS RECTANGULAR BAR

Old Alloy No. 271  
New Alloy No. 360  
12 Foot Mill Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$ X $1\frac{1}{4}$	.576	$\frac{5}{16}$ X 1	1.198	$\frac{1}{2}$ X 4	7.368
$\frac{5}{32}$ X $\frac{1}{2}$	.287	$1\frac{1}{2}$	1.75	$\frac{5}{8}$ X $\frac{3}{4}$	1.727
$\frac{3}{16}$ X $\frac{3}{8}$	.259	2	2.303	$\frac{7}{8}$	2.016
$\frac{1}{2}$	.345	3	3.453	1	2.303
$\frac{5}{8}$	.432	$\frac{3}{8}$ X $\frac{1}{2}$	.691	$1\frac{1}{4}$	2.879
$\frac{3}{4}$	.518	$\frac{5}{8}$	.864	$1\frac{1}{2}$	3.431
$\frac{7}{8}$	.604	$\frac{3}{4}$	1.036	2	4.606
1	.691	$\frac{7}{8}$	1.209	$\frac{3}{4}$ X 1	2.763
$1\frac{1}{4}$	.863	1	1.382	$1\frac{1}{4}$	3.454
$1\frac{1}{2}$	1.036	$1\frac{1}{4}$	1.727	$1\frac{1}{2}$	4.145
2	1.382	$1\frac{1}{2}$	2.072	$1\frac{3}{4}$	4.835
$\frac{1}{4}$ X $\frac{3}{8}$	.345	$1\frac{3}{4}$	2.418	2	5.527
$\frac{1}{2}$	.460	2	2.763	1 X $1\frac{1}{2}$	5.527
$\frac{5}{8}$	.576	$2\frac{1}{2}$	3.454	2	7.370
$\frac{3}{4}$	.691	3	4.145		
$\frac{7}{8}$	.806	$3\frac{1}{2}$	4.834		
1	.921	4	5.526		
$1\frac{1}{4}$	1.151	5	6.908		
$1\frac{1}{2}$	1.382	$\frac{1}{2}$ X $\frac{5}{8}$	1.152		
$1\frac{3}{4}$	1.612	$\frac{3}{4}$	1.382		
2	1.842	$\frac{7}{8}$	1.612		
$2\frac{1}{2}$	2.303	1	1.842		
3	2.763	$1\frac{1}{4}$	2.303		
$3\frac{1}{2}$	3.224	$1\frac{1}{2}$	2.763		
4	3.684	$1\frac{3}{4}$	3.224		
5*	4.606	2	3.684		
$\frac{5}{16}$ X $\frac{1}{2}$	.56	$2\frac{1}{2}$	4.605		
$\frac{3}{4}$	.863	3	5.526		

\* Forging Brass

# BRASS

## HIGH LEADED BRASS RECTANGULAR BAR

Old Alloy No. 243  
New Alloy No. 353  
12 Foot Mill Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{3}{32} \times \frac{1}{4}$	.086	$\frac{1}{8} \times \frac{3}{16}$	.086
$\frac{3}{8}$	.129	$\frac{1}{4}$	.115
$\frac{1}{2}$	.173	$\frac{3}{8}$	.173
$\frac{5}{8}$	.216	$\frac{1}{2}$	.230
$\frac{3}{4}$	.259	$\frac{5}{8}$	.288
$\frac{7}{8}$	.302	$\frac{3}{4}$	.345
1	.345	$\frac{7}{8}$	.403
$1\frac{1}{4}$	.432	1	.460
$1\frac{1}{2}$	.518	$1\frac{1}{8}$	.518
2 *	.691	$1\frac{1}{4}$	.576
		$1\frac{1}{2}$	.691
		$1\frac{3}{4}$	.806
		2	.921

\*Extra High Ledded

## HALF HARD RECTANGULAR BRASS BAR

Old Alloy No. 42  
New Alloy No. 260  
12 Foot Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{16} \times \frac{1}{4}$ *	.058	$\frac{1}{16} \times 1\frac{1}{2}$	.345
$\frac{5}{16}$ *	.072	$1\frac{3}{4}$	.396
$\frac{3}{8}$ *	.086	2	.460
$\frac{1}{2}$	.115	$2\frac{1}{4}$	.520
$\frac{5}{8}$	.144	$2\frac{1}{2}$	.560
$\frac{3}{4}$	.173	3	.691
1	.230	4	.900
$1\frac{1}{4}$	.288	5	1.12

\* Flat Wire Size

## HALF HARD RECTANGULAR BRASS BAR

Extra High Ledded  
Old Alloy No. 238  
New Alloy No. 356  
12 Foot Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{3}{32} \times 2$	8.22	$\frac{1}{8} \times 3$	1.381	$\frac{3}{16} \times 4$	2.764
3	1.036	$\frac{3}{16}$	1.619	5	3.45
4	1.424	4	1.912	$\frac{3}{8} \times 5$	6.90
$\frac{1}{8} \times 2\frac{1}{4}$	1.036	5	2.302		
$2\frac{1}{2}$	1.151	$\frac{3}{16} \times 2\frac{1}{2}$	1.727		

STAINLESS STEEL

TUBING • PIPE  
• SHAPES

HYDRAULIC TUBING  
STEEL

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS



# BRASS



## FREE CUTTING BRASS HEXAGONAL ROD



Old Alloy No. 271  
New Alloy No. 360  
Mill Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{3}{32}$	.02804	$\frac{3}{4}$	1.795	$1\frac{9}{16}$	7.789
$\frac{7}{64}$	.0383	$\frac{13}{16}$	2.106	$1\frac{5}{8}$	8.425
$\frac{1}{8}$	.04985	$\frac{7}{8}$	2.443	$1\frac{11}{16}$	9.085
$\frac{3}{16}$	.1122	$1\frac{5}{16}$	2.804	$1\frac{3}{4}$	9.771
$\frac{7}{32}$	.1527	1	3.190	$1\frac{13}{16}$	10.48
$\frac{1}{4}$	.1994	$1\frac{1}{16}$	3.602	$1\frac{7}{8}$	11.22
$\frac{5}{16}$	.3116	$1\frac{1}{8}$	4.038	$1\frac{15}{16}$	11.98
$\frac{3}{8}$	.4487	$1\frac{3}{8}$	4.499	2	12.76
$\frac{7}{16}$	.6107	$1\frac{1}{4}$	4.985	$2\frac{1}{4}$	16.15
$\frac{1}{2}$	.7976	$1\frac{5}{8}$	5.496	$2\frac{3}{8}$	18.00
$\frac{9}{16}$	1.009	$1\frac{3}{4}$	6.032	$2\frac{1}{2}$	19.94
$\frac{5}{8}$	1.246	$1\frac{7}{8}$	6.593	$2\frac{5}{8}$	21.98
$1\frac{1}{16}$	1.508	$1\frac{1}{2}$	7.178	$2\frac{3}{4}$	24.13



## FREE CUTTING BRASS HALF OVAL ROD



12 Foot Random Lengths  
Old Alloy No. 271  
New Alloy No. 360

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{3}{32} \times \frac{3}{8}$	.100	$\frac{3}{16} \times \frac{3}{4}$	.344	$\frac{5}{16} \times 1\frac{1}{4}$	1.000
$\frac{1}{8} \times \frac{3}{8}$	.151	$\frac{7}{32} \times \frac{7}{8}$	.512	$\frac{3}{8} \times 1\frac{1}{2}$	1.448
$\frac{1}{8} \times \frac{1}{2}$	.180	$\frac{1}{4} \times 1$	.644	$\frac{1}{2} \times 2$	2.58
$\frac{5}{32} \times \frac{5}{8}$	.281				



## FREE CUTTING BRASS HALF ROUND BAR



12 Foot Random Lengths  
Old Alloy No. 271  
New Alloy No. 360

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{5}{32} \times \frac{5}{16}$	.141	$\frac{3}{8} \times \frac{3}{4}$	.814	$\frac{5}{8} \times 1\frac{1}{4}$	2.261
$\frac{1}{4} \times \frac{1}{2}$	.362	$\frac{7}{16} \times \frac{7}{8}$	1.109	$\frac{3}{4} \times 1\frac{1}{2}$	3.255
$\frac{5}{16} \times \frac{5}{8}$	.565	$\frac{1}{2} \times 1$	1.45		

# BRASS



## NAVAL BRASS ROUND ROD

Mill Lengths  
Old Alloy No. 450  
New Alloy No. 464

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
1/8	.0448	1 1/8	3.626	2	11.46
3/16	.1007	1 3/16	4.040	2 1/4	14.50
1/4	.1791	1 1/4	4.477	2 3/8	16.16
5/16	.2798	1 5/16	4.936	2 7/16	17.02
3/8	.4029	1 3/8	5.417	2 1/2	17.91
7/16	.5484	1 7/16	5.921	2 3/4	21.67
1/2	.7163	1 1/2	6.447	3	25.79
9/16	.9065	1 9/16	6.995	3 1/8	27.97
5/8	1.119	1 5/8	7.566	3 1/4	30.26
11/16	1.354	1 11/16	8.16	3 1/2	35.10
3/4	1.612	1 3/4	8.774	3 3/4	40.29
7/8	2.194	1 25/32	9.090	4	45.84
1	2.865	1 7/8	10.07	4 1/2	58.02
1 1/16	3.234				



## NAVAL BRASS HEXAGONAL ROD

Mill Lengths  
Old Alloy No. 450  
New Alloy No. 464

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
1/4	.1974	3/4	1.777	1 3/8	5.973
5/16	.3085	13/16	2.085	1 1/2	7.108
3/8	.4443	7/8	2.419	1 5/8	8.342
7/16	.6047	15/16	2.777	1 3/4	9.675
1/2	.7898	1	3.159	2	12.64
5/8	1.234	1 1/8	3.998	2 1/4	15.99
11/16	1.493	1 1/4	4.936	2 1/2	19.75

STAINLESS STEEL

TUBING • PIPE  
• SHAPES

HYDRAULIC TUBING  
STEEL

COPPER

CURRENT CATALOG

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

# BRASS



## TOBIN BRONZE ROUND ROD

Mill Lengths  
Alloy No. 452

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$	.045	1	2.865	$2\frac{1}{4}$	14.50
$\frac{1}{4}$	.1791	$1\frac{1}{4}$	3.23	$2\frac{1}{2}$	17.91
$\frac{5}{16}$	.279	$1\frac{1}{8}$	3.626	$2\frac{3}{4}$	21.67
$\frac{3}{8}$	.4029	$1\frac{3}{16}$	4.040	3	25.79
$\frac{7}{16}$	.5484	$1\frac{1}{4}$	4.477	$3\frac{1}{4}$	30.22
$\frac{1}{2}$	.7163	$1\frac{5}{16}$	4.93	$3\frac{1}{2}$	35.10
$\frac{9}{16}$	.9065	$1\frac{3}{8}$	5.417	$3\frac{3}{4}$	40.29
$\frac{5}{8}$	1.119	$1\frac{1}{2}$	6.447	4	45.84
$\frac{11}{16}$	1.353	$1\frac{5}{8}$	7.566	$4\frac{1}{2}$	58.02
$\frac{3}{4}$	1.612	$1\frac{3}{4}$	8.774	5	71.63
$\frac{13}{16}$	1.89	$1\frac{7}{8}$	10.07	$5\frac{1}{2}$	86.67
$\frac{7}{8}$	2.194	2	11.46	6" X 5'	103.1
$\frac{15}{16}$	2.518	$2\frac{1}{8}$	12.92		



## TOBIN BRONZE SHAFTING

Turned and  
Specially Straightened  
Alloy No. 452

Size (in inches)	Exact Length (in feet)	Pounds per Lineal Foot	Size (in inches)	Exact Length (in feet)	Pounds per Lineal Foot
$\frac{3}{4}$	12	1.612	$1\frac{1}{2}$	18	6.447
$\frac{7}{8}$	12	2.19		20	6.447
1	12	2.865	$1\frac{3}{4}$	16	8.77
	16	2.865		18	8.77
	18	2.865	$1\frac{7}{8}$	15	10.07
$1\frac{1}{8}$	12	3.626	2	12	11.46
	15	3.626		22	11.46
	16	3.626	$2\frac{1}{2}$	12	17.91
$1\frac{1}{4}$	12	4.477		15	17.91
	15	4.477		22	17.91
	16	4.477	$2\frac{3}{4}$	22	21.67
	18	4.477	3	12	25.79
$1\frac{3}{8}$	18	5.41		18	25.79
$1\frac{1}{2}$	12	6.477		22	25.79
	15	6.447	$3\frac{1}{4}$	16	30.30
	16	6.447	$3\frac{1}{2}$	16	35.10



# BRASS

## TOBIN BRONZE HEXAGONAL ROD

Alloy No. 452  
12 Foot Mill Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{7}{8}$	2.416	$1\frac{1}{2}$	7.10
1	3.155	$1\frac{3}{4}$	9.66
$1\frac{1}{4}$	4.93	2	12.62

## FORGING BRASS ROUND ROD

Old Alloy No. 250  
New Alloy No. 377  
12 Foot Mill Lengths

Diameter (in inches)	Pounds per Lineal Foot
$\frac{23}{32}$	1.49
$\frac{27}{32}$	2.06
$1\frac{19}{32}$	7.10

## COMMERCIAL BRONZE ROUND ROD

Leaded  
Old Alloy No. 202  
New Alloy No. 314  
12 Foot Mill Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{3}{16}$	.105	$\frac{5}{8}$	1.18
$\frac{1}{4}$	.188	$\frac{3}{4}$	1.70
$\frac{5}{16}$	.294	1	2.98
$\frac{3}{8}$	.425	$1\frac{1}{4}$	4.69
$\frac{7}{16}$	.575	$1\frac{3}{8}$	5.68
$\frac{1}{2}$	.754	$1\frac{1}{2}$	6.76
$\frac{9}{16}$	.958		

STAINLESS STEEL

TUBING • PIPE  
• SHAPES

HYDRAULIC TUBING  
STEEL

SHEET • PLATE  
ROD • SHAPES • WIRE

MONEL-NICKEL

COPPER

FOUNDRY • WELDING  
BRAZING PRODUCTS

# BRASS

## COMMERCIAL BRONZE SQUARE BAR

Leaded  
Old Alloy No. 202  
New Alloy No. 314  
12 Foot Mill Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{3}{8}$	.527	$\frac{5}{8}$	1.49
$\frac{1}{2}$	.968	1	3.84

## COMMERCIAL BRONZE RECTANGULAR ROD

Old Alloy No. 14  
New Alloy No. 220  
12 Foot Mill Length

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{8} \times \frac{1}{2}$	.25	$\frac{3}{8} \times \frac{1}{2}$	.75
$\frac{5}{8}$	.31	$\frac{3}{4}$	1.12
1	.50	1	1.50
$1\frac{1}{2}$	.75	$1\frac{1}{4}$	1.87
2	1.00	$1\frac{1}{2}$	2.25
$\frac{3}{16} \times 1\frac{1}{2}$	1.12	2	3.00
2	1.50	$\frac{1}{2} \times \frac{5}{8}$	1.25
$\frac{1}{4} \times \frac{3}{8}$	.37	$\frac{3}{4}$	1.50
1	1.00	1	2.00
$1\frac{1}{4}$	1.25	$1\frac{1}{4}$	2.50
$1\frac{1}{2}$	1.50	2	4.00
2	2.00	$\frac{3}{4} \times 1\frac{1}{2}$	4.50
$\frac{5}{16} \times 1$	1.25		

## ARCHITECTURAL BRONZE ROUND BAR

Extruded  
Old Alloy No. 280  
New Alloy No. 385  
16 Foot Lengths

Diameter (in inches)	Pounds per Lineal Foot
$\frac{3}{8}$	.407
$\frac{1}{2}$	.728

# BRASS

## ARCHITECTURAL BRONZE SQUARE BAR

Extruded  
Old Alloy No. 280  
New Alloy No. 385  
16 Foot Lengths

Size (in inches)	Pounds per Lineal Foot
$\frac{3}{8}$	.518
$\frac{1}{2}$	.921
$\frac{3}{4}$	2.072

## ARCHITECTURAL BRONZE RECTANGULAR ROD

Old Alloy No. 280  
New Alloy No. 385  
16 Foot Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{8} \times \frac{3}{4}$	.345	$\frac{1}{4} \times \frac{3}{8}$	.342	$\frac{3}{8} \times \frac{3}{4}$	1.036
1	.461	$\frac{1}{2}$	.476	1	1.382
$\frac{1}{4}$	.576	1	.921	$\frac{1}{4}$	1.727
$\frac{1}{2}$	.691	$\frac{1}{4}$	1.151	2	2.763
$2\frac{1}{2}$	1.16	$\frac{1}{2}$	1.38	$\frac{1}{2} \times \frac{3}{4}$	1.382
$\frac{3}{16} \times 1$	.689	$\frac{1}{4} \times 2$	1.842	$\frac{1}{2}$	2.74
2	1.38	$2\frac{1}{2}$	2.303	2	3.684

## PHOSPHUR BRONZE ROUND ROD

Spec. F  
Old Alloy No. 610  
New Alloy No. 544  
12 Foot Mill Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{5}{32}$	.074	$\frac{1}{2}$	.754	$1\frac{1}{8}$	3.82
$\frac{3}{16}$	.106	$\frac{9}{16}$	.954	$1\frac{1}{4}$	4.71
$\frac{1}{4}$	.188	$\frac{5}{8}$	1.18	$1\frac{3}{8}$	5.70
$\frac{5}{16}$	.294	$\frac{3}{4}$	1.69	$1\frac{1}{2}$	6.78
$\frac{3}{8}$	.424	$\frac{7}{8}$	2.31	$1\frac{3}{4}$	9.23
$\frac{7}{16}$	.577	1	3.02	2	12.06

STAINLESS STEEL

TUBING • PIPE  
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STEEL

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MONEL-NICKEL

BRAZING PRODUCTS



# BRASS

## EVERDUR BRONZE ROUND ROD

Diameter (in inches)	Pounds per Lineal Foot
$\frac{3}{16}$	.1021
$\frac{1}{4}$	.1814
$\frac{5}{16}$	.2835
$\frac{3}{8}$	.4082
$\frac{7}{16}$	.5556
$\frac{1}{2}$	.7257
$\frac{9}{16}$	.9185
$\frac{5}{8}$	1.134

Cold Drawn  
Alloy No. 1010  
12 Foot Mill Lengths

Diameter (in inches)	Pounds per Lineal Foot
$\frac{3}{4}$	1.633
$\frac{7}{8}$	2.222
1	2.903
$1\frac{1}{8}$	3.674
$1\frac{1}{4}$	4.536
$1\frac{1}{2}$	6.531
$1\frac{3}{4}$	8.890
2	11.61

## 10% NICKEL SILVER ROUND ROD

Diameter (in inches)	Pounds per Lineal Foot
$\frac{7}{16}$	.564
$\frac{1}{2}$	.737
$\frac{5}{8}$	1.51
$\frac{3}{4}$	1.658

Cold Drawn, Leaded  
Old Alloy No. 825  
New Alloy No. 796  
12 Foot Mill Lengths

Diameter (in inches)	Pounds per Lineal Foot
$\frac{7}{8}$	2.257
1	2.948
$1\frac{1}{4}$	4.653

## 12% NICKEL SILVER ROUND ROD

Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$	.046
$\frac{5}{32}$	.072
$\frac{3}{16}$	.104

Cold Drawn, Leaded  
Old Alloy No. 745  
New Alloy No. 7921  
12 Foot Mill Lengths

Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{4}$	.184
$\frac{5}{16}$	.288
$\frac{3}{8}$	.415

# BRASS

## SOFT BRASS WIRE — COILED

Diameter (in inches)	Pounds per Lineal Foot
.0254	.00184
.0320	.00294
.0403	.00467
.0508	.00742
.0641	.0018

### New Alloy No. 260

Diameter (in inches)	Pounds per Lineal Foot
.0907	.0237
.1144	.0376
.1285	.0475
.2500	.1808

## SPRING TEMPER BRASS WIRE — COILED

Diameter (in inches)	Pounds per Lineal Foot
.0320	.00294
.0403	.00467
.0453	.00590

### New Alloy No. 260

Diameter (in inches)	Pounds per Lineal Foot
.0508	.00742
.0641	.0118
.1285	.0475

## DURAFLEX PHOSPHOR BRONZE SPRING WIRE — COILED

Diameter (in inches)	Pounds per Lineal Foot
.0201	.00122
.0253	.00193
.0320	.00309
.0359	.00389
.0403	.00490
.0453	.00619
.0508	.00778
.0571	.00983

### Old Alloy No. 351

### New Alloy No. 510

Diameter (in inches)	Pounds per Lineal Foot
.0641	.0124
.0719	.0156
.0808	.0197
.0907	.0248
.1019	.0313
.1285	.0498
.1819	.1000

STAINLESS STEEL

TUBING • PIPE  
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STEEL

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FOUNDRY • WELDING  
BRAZING PRODUCTS

# BRASS

## YELLOW BRASS HARD DRAWN ROUND TUBING

Old Alloy No. 218  
New Alloy No. 330  
Mill Lengths

O.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot	O.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$	.032	.0344	$\frac{1}{2}$	.049	.256
$\frac{3}{16}$	.032	.0576		.065	.327
$\frac{1}{4}$	.014	.0382		.125	.543
	.025	.065	$\frac{9}{16}$	.020	.126
	.032	.0807		.028	.173
	.035	.0871		.032	.196
	.042	.101		.042	.253
	.049	.114	$\frac{5}{8}$	.020	.140
	.065	.139		.025	.174
$\frac{5}{16}$	.014	.0484		.032	.220
	.025	.0832		.035	.239
	.032	.104		.042	.283
	.042	.131		.049	.327
	.035	.112		.065	.421
	.049	.149		.083	.521
	.065	.186		.125	.723
$\frac{3}{8}$	.014	.0585	$\frac{11}{16}$	.028	.214
	.018	.0744	$\frac{3}{4}$	.020	.169
	.020	.0822		.032	.266
	.028	.112		.035	.290
	.032	.127		.042	.344
	.035	.138		.045	.367
	.042	.162		.049	.398
	.049	.185		.058	.465
	.065	.233		.065	.515
$\frac{7}{16}$	.028	.133		.083	.641
	.032	.150		.125	.904
	.042	.192	$\frac{13}{16}$	.028	.254
	.065	.280	$\frac{7}{8}$	.020	.198
$\frac{1}{2}$	.020	.111		.032	.312
	.025	.137		.035	.340
	.032	.173		.065	.609
	.035	.188	$\frac{15}{16}$	.042	.435
	.042	.223			

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# BRASS

## YELLOW BRASS HARD DRAWN ROUND TUBING (Continued)

Old Alloy No. 218  
New Alloy No. 330  
Mill Lengths

O.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot	O.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
1	.020	.227	1 $\frac{3}{4}$	.095	1.82
	.025	.282		.125	2.35
	.032	.359	2	.032	.729
	.035	.391		.065	1.46
	.042	.466		.095	2.095
	.049	.550		.125	2.71
	.065	.703	2 $\frac{1}{8}$	.125	2.89
	.083	.881	2 $\frac{1}{4}$	.045	1.150
	.125	1.27		.065	1.64
1 $\frac{1}{16}$	.042	.496		.109	2.701
1 $\frac{1}{8}$	.025	.318		.125	3.07
	.042	.526	2 $\frac{3}{8}$	.125	3.26
	.065	.797	2 $\frac{1}{2}$	.042	1.195
	.125	1.45		.065	1.83
1 $\frac{1}{4}$	.025	.354		.109	3.016
	.032	.451		.125	3.44
	.049	.681	2 $\frac{3}{4}$	.065	2.02
	.065	.891		.125	3.80
	.072	.982	3	.049	1.67
	.125	1.63		.065	2.21
1 $\frac{3}{8}$	.032	.497		.120	4.00
	.042	.648		.125	4.16
	.065	.986	3 $\frac{1}{4}$	.065	2.39
	.125	1.81		.125	4.52
1 $\frac{1}{2}$	.025	.427	3 $\frac{1}{2}$	.065	2.58
	.032	.544		.125	4.88
	.035	.593		.134	5.22
	.042	.709	3 $\frac{3}{4}$	.125	5.24
	.065	1.08	4	.065	2.96
	.125	1.99		.125	5.61
1 $\frac{5}{8}$	.045	.823	4 $\frac{1}{4}$	.125	5.97
	.065	1.17	4 $\frac{1}{2}$	.120	6.083
	.083	1.480		.125	6.33
1 $\frac{3}{4}$	.032	.636	4 $\frac{3}{4}$	.125	6.61
	.065	1.27			

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STAINLESS STEEL

TUBING • PIPE  
• SHAPES

HYDRAULIC TUBING  
STEEL

COPPER

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FOUNDRY • WELDING  
BRAZING PRODUCTS

# BRASS

## YELLOW BRASS HARD DRAWN ROUND TUBING (Continued)

Old Alloy No. 218  
New Alloy No. 330  
Mill Lengths

O.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot	O.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
5	.065	3.71	6	.065	4.46
	.120	6.777		.125	8.50
	.125	7.05	6 $\frac{1}{4}$	.125	8.86
5 $\frac{1}{4}$	.125	7.42	6 $\frac{1}{2}$	.125	9.22
5 $\frac{1}{2}$	.125	7.78	6 $\frac{3}{4}$	.125	9.58
5 $\frac{3}{4}$	.125	8.71	7	.125	9.94
			8	.125	11.38

## ROUND BRASS TELESCOPE TUBING

Temper as Drawn  
Old Alloy No. 218  
New Alloy No. 330

O.D. (in inches)	Wall (in inches)	Length (in feet)	Pounds per Lineal Foot
$\frac{1}{16}$	.016	3	.0090
$\frac{3}{32}$	.014	3	.0130
$\frac{1}{8}$	.014	3	.0180
$\frac{5}{32}$	.014	3	.0230
$\frac{3}{16}$	.014	6	.0280
$\frac{7}{32}$	.014	6	.0332
$\frac{1}{4}$	.014	6	.0380
$\frac{9}{32}$	.014	6	.0433
$\frac{5}{16}$	.014	6	.0484
$\frac{11}{32}$	.014	6	.0534
$\frac{3}{8}$	.014	6	.0590
$\frac{13}{32}$	.014	6	.0635

# BRASS

## SQUARE BRASS TUBING

Old Alloy No. 42  
New Alloy No. 260  
12 Foot Lengths

Size (in inches)	Wall (in inches)	Pounds per Lineal Foot
$\frac{1}{2}$	.042	.280
$\frac{5}{8}$	.042	.350
$\frac{3}{4}$	.042	.420
1	.042	.570
$1\frac{1}{4}$	.042	.720

## COMMERCIAL BRONZE SQUARE TUBING

Old Alloy No. 14  
New Alloy No. 220

Size (in inches)	Wall (in inches)	Pounds per Lineal Foot
1	.065	.89

## RED BRASS SQUARE TUBING

Formerly 85% Rich Low Brass  
Old Alloy No. 24  
New Alloy No. 230  
16 Foot Lengths

Size (in inches)	Wall (in inches)	Pounds per Lineal Foot
$\frac{1}{2}$	.065	.430
$\frac{3}{4}$	.065	.680
1	.065	.920
3	.083	3.69

STAINLESS STEEL

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

HYDRAULIC TUBING  
STEEL

COPPER

FOUNDRY • WELDING  
BRAZING PRODUCTS



# BRASS

## RED BRASS RECTANGULAR TUBING

Formerly 85% Rich Low Brass  
Old Alloy No. 24  
New Alloy No. 230  
16 Foot Lengths

Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{3}{8} \times 1\frac{1}{4}$	.065	.740	1 X 1½	.065	1.18
$\frac{1}{2} \times 1$	.065	.670	2	.065	1.41
$\frac{1}{2}$	.065	.920	1¼ X 3	.083	2.43
$\frac{5}{8} \times 1\frac{1}{4}$	.065	.870	1¾ X 3	.083	2.84
$\frac{3}{4} \times 1\frac{1}{2}$	.065	1.18	4	.083	3.46
2	.065	1.41	5	.083	4.08

## 85% RED BRASS PIPE

Old Alloy No. 24  
New Alloy No. 230

S.P.S. (in inches)	O.D. (in inches)	Wall (in inches)	I.D. (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$	.405	.062	.281	.253
$\frac{1}{4}$	.540	.082	.376	.447
$\frac{3}{8}$	.675	.090	.495	.627
$\frac{1}{2}$	.840	.107	.626	.934
$\frac{3}{4}$	1.050	.114	.822	1.27
1	1.315	.126	1.063	1.78
1¼	1.660	.146	1.368	2.63
1½	1.900	.150	1.600	3.13
2	2.375	.156	2.063	4.12
2½	2.875	.187	2.501	5.99
3	3.500	.219	3.062	8.56
3½	4.000	.250	3.500	11.2
4	4.500	.250	4.000	12.7
5	5.562	.250	5.062	15.8
6	6.625	.250	6.125	19.0
8	8.625	.312	8.001	30.9

# BRASS

## 85% RED BRASS PIPE EXTRA HEAVY

Old Alloy No. 24  
New Alloy No. 230

S.P.S. (in inches)	O.D. (in inches)	Wall (in inches)	I.D. (in inches)	Pounds per Lineal Foot
1/8	.405	.100	.205	.363
1/4	.540	.123	.294	.611
3/8	.675	.127	.421	.829
1/2	.840	.149	.542	1.23
3/4	1.050	.157	.736	1.67
1	1.315	.182	.951	2.46
1 1/4	1.660	.194	1.272	3.39
1 1/2	1.900	.203	1.494	4.10
2	2.375	.221	1.933	5.67
2 1/2	2.875	.280	2.315	8.66
3	3.500	.304	2.892	11.6
4	4.500	.341	3.818	16.9
6	6.625	.437	5.751	32.2
8	8.625	.500	7.625	48.4

## EVERDUR PIPE

Alloy No. 1010  
12 Foot Lengths

S.P.S. (in inches)	O.D. (in inches)	Wall (in inches)	I.D. (in inches)	Pounds per Lineal Foot
1	1.315	.126	1.063	1.75
1 1/2	1.900	.150	1.600	3.05
2	2.375	.156	2.602	4.03

STAINLESS STEEL

HYDRAULIC TUBING  
STEEL

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

# BRASS

## CONDENSER AND HEAT EXCHANGER TUBES

ALLOYS: ADMIRALTY  
ARSENICAL COPPER  
CUZINAL ALUMINUM & BRASS  
ALUMINUM BRONZE 95/5  
CUPRO NICKEL 10 %  
CUPRO NICKEL 20 %  
CUPRO NICKEL 30 %

OUTSIDE DIAMETERS:  $\frac{5}{8}$ " ,  $\frac{3}{4}$ " ,  $\frac{7}{8}$ " , 1"

WALL THICKNESS: .042, .049, .058, .065, .072, .083

LENGTHS: 1'-40' INCLUSIVE

THE ABOVE ALLOYS AND SIZES AS WELL AS OTHER UNLISTED ALLOYS AND SIZES ARE AVAILABLE AND QUOTED ON APPLICATION.

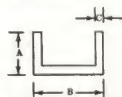
## HALF HARD BRASS ANGLES

Drawn

Size (in inches)	Thickness (in inches)	Pounds per Lineal Foot
$\frac{1}{4}$ X $\frac{1}{4}$	.045	.080
$\frac{3}{8}$ X $\frac{3}{8}$	.045	.117
$\frac{1}{2}$ X $\frac{1}{2}$	.062	.214
$\frac{5}{8}$ X $\frac{5}{8}$	.062	.270
$\frac{3}{4}$ X $\frac{3}{4}$	.062	.330
1 X 1	.062	.440
$1\frac{1}{2}$ X $1\frac{1}{2}$	.062	.690

## HALF HARD BRASS CHANNELS

Drawn



A (in inches)	B (in inches)	C (in inches)	Pounds per Lineal Foot
$\frac{3}{8}$	$\frac{3}{8}$	.040	.154
$\frac{3}{8}$	$\frac{3}{8}$	.064	.235
$\frac{3}{8}$	$\frac{1}{2}$	.081	.330
$\frac{3}{8}$	$\frac{5}{8}$	.081	.360
$\frac{3}{8}$	$\frac{3}{4}$	.040	.208
$\frac{1}{2}$	1	.081	.540
$\frac{3}{4}$	$\frac{3}{4}$	.064	.500



# BRASS

## ARCHITECTURAL BRONZE ANGLE EXTRUDED

Old Alloy No. 280  
New Alloy No. 385

Size (in inches)	Thickness (in inches)	Pounds Per Foot
$\frac{3}{8} \times \frac{3}{8}$	$\frac{3}{32}$	.22
$\frac{1}{2} \times \frac{1}{2}$	$\frac{3}{32}$	.31
	$\frac{1}{8}$	.4035
$\frac{3}{4} \times \frac{3}{4}$	$\frac{3}{32}$	.48
	$\frac{1}{8}$	.5600
1 × 1	$\frac{1}{8}$	.8646
	$\frac{3}{16}$	1.25
$1\frac{1}{4} \times 1\frac{1}{4}$	$\frac{1}{8}$	1.095
	$\frac{1}{4}$	2.10
$1\frac{1}{2} \times 1\frac{1}{2}$	$\frac{1}{8}$	1.326
	$\frac{3}{16}$	1.92
	$\frac{1}{4}$	2.650
2 × 2	$\frac{1}{8}$	1.787
	$\frac{1}{4}$	3.42
	$\frac{3}{16}$	2.61
$2\frac{1}{2} \times 2\frac{1}{2}$	$\frac{3}{16}$	3.44
	$\frac{1}{4}$	4.35
3 × 3	$\frac{1}{4}$	5.25

## ARCHITECTURAL BRONZE UNEQUAL ANGLES

Extruded  
Old Alloy No. 280  
New Alloy No. 385  
16 Foot Lengths

Size (in inches)	Thickness (in inches)	Pounds Per Foot
$\frac{1}{2} \times \frac{3}{4}$	.125	.52
1	.125	.65
$1\frac{1}{2}$	.125	.84
$\frac{3}{4} \times 1$	.125	.75
$1\frac{1}{2}$	.125	.97
1 × $1\frac{1}{4}$	.125	1.00
$1\frac{1}{2}$	.125	1.10
2	.125	1.33

STAINLESS STEEL

HYDRAULIC TUBING  
STEEL

COPPER

SHEET • PLATE

ROD • SHAPES • WIRE

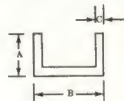
MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

# BRASS

Extruded  
Old Alloy No. 280  
New Alloy No. 385  
16 Foot Lengths

## ARCHITECTURAL BRONZE CHANNELS



A (in inches)	B (in inches)	C (in inches)	Pounds per Lineal Foot
$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{32}$	.33
$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{32}$	.36
$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{32}$	.45
$\frac{3}{8}$	$\frac{3}{4}$	$\frac{1}{8}$	.57
$\frac{3}{8}$	1	$\frac{1}{8}$	.69
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{32}$	.45
$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{32}$	.52
$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{8}$	.68
$\frac{1}{2}$	1	$\frac{1}{8}$	.84
$\frac{1}{2}$	$1\frac{1}{4}$	$\frac{1}{8}$	.93
$\frac{1}{2}$	$1\frac{1}{2}$	$\frac{1}{8}$	1.02
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{32}$	.68
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{8}$	.90
$\frac{3}{4}$	1	$\frac{1}{8}$	1.04
$\frac{3}{4}$	$1\frac{1}{2}$	$\frac{1}{8}$	1.26
1	1	$\frac{1}{8}$	1.25
1	$1\frac{1}{2}$	$\frac{1}{8}$	1.45
$1\frac{1}{2}$	$1\frac{1}{2}$	$\frac{1}{8}$	1.80
1	2	$\frac{1}{8}$	1.75

SHEET • PLATE ROD • SHAPES • WIRE

MONEL-NICKEL

BRAZING PRODUCTS

STAINLESS STEEL

PON • WIDE

TUBING • PIPE

HYDRAULIC TUBING  
STEEL

COPPER



## WHAT DO YOU WANT TO KNOW ABOUT

# COPPER

If you machine, weld, roll, bend, punch or fabricate copper alloys in any way, you probably run into problems.

Perhaps our own technical men have the answer for you. You may find the information you need in one of the free technical booklets of the Anaconda American Brass Company. Some of this literature is listed on the next page.



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# COPPER

Stocks change from time to time. If the material you want is not listed here, call or write our office nearest you for additional information.

## LITERATURE ON COPPER

Here are a few of the booklets published by the Anaconda American Brass Company that are available to you. This literature is free, and may be had by calling or writing our office nearest you.

### Anaconda Copper and Copper Alloys

Data for the user of Copper & Copper Alloys

Copper & Copper Alloy Metalexicon

### PRACTICAL SUGGESTIONS for

Machining Copper, Brass

Bronze and Nickel Silver

Tubes and Plates for Condensers and Heat Exchangers

Copper for Electrical

Conductors

Rods for Screw Machine Products

Welding Rods and Procedures for Welding Copper and Copper Alloys

Copper Tubes and Fittings

Anaconda through-wall

flashing

Extruded Architectural Bronze Thresholds

EVEDUR alloys, physical properties and applications

EVEDUR Electrical Conduit

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Syracuse, N. Y. ....HOward 3-6241

Windsor, Conn. ....phone 688-4921

Rochester, N. Y. ....BUtler 8-2141

# COPPER SHEET WEIGHT TABLE

Pounds per  
Square Foot

OLD ALLOY NO. 100  
NEW ALLOY NO. 110

Thickness (in inches)	Nearest B&S Gauge	Pounds per Sq. Ft.	Thickness (in inches)	Nearest B&S Gauge	Pounds per Sq. Ft.
.500	—	23.18	.0970	10	4½
.375	—	17.39	.0937	—	4.347
.3451	2/0	16	.0863	11	4
.3235	1/0	15	.0755	13	3½
.3125	—	14.49	.0647	14	3
.3019	1	14	.0625	—	2.898
.2804	1	13	.0593	15	2¾
.2588	2	12	.0539	16	2½
.250	—	11.59	.0485	16	2¼
.2372	3	11	.0431	17	2
.2157	4	10	.0377	19	1¾
.2049	4	9½	.0323	20	1½
.1941	4	9	.0270	21	1¼
.1875	—	8.694	.0243	22	1⅛
.1833	5	8½	.0216	23	1
.1725	5	8	.0189	25	⅞
.1617	6	7½	.0162	26	¾
.1510	7	7	.0135	27	⅝
.1402	7	6½	.0108	29	½
.1294	8	6	.0081	32	⅜
.125	—	5.796	.0054	35	¼
.1186	9	5½	.0027	41	⅙
.1078	10	5			

SHEET

STAINLESS STEEL

ROD • WIRE

TUBING • PIPE

HYDRAULIC TUBING  
STEEL

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SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

BRAZING PRODUCTS

# COPPER

## SOFT COPPER STRIP — COILED

Old Alloy No. 100  
New Alloy No. 110

Thickness (in inches)	Width in inches	Pounds per Lineal Foot
.005	12	.2318
.0063	12	.2921
6 OZ. (.0081)	12	.37
8 OZ. (.0108)	12	.500
10 OZ. (.0135)	12	.625
	20	1.01
	24	1.25
12 OZ. (.0162)	12	.750
	14	.875
14 OZ. (.0189)	12	.875
16 OZ. (.0216)	6	.500
	8	.667
	10	.833
	12	1.000
	14	1.167
	15	1.250
	16	1.333
	18	1.500
	20	1.667
18 OZ. (.0243)	6	.563
	8	.750
	12	1.125
	14	1.316
24 OZ. (.0323)	8	.99
	12	1.50
	16	2.00
30 OZ. (.0404)	12	1.87
32 OZ. (.0431)	12	2.00
	14	2.33



# COPPER

## SOFT COPPER SHEET — FLAT

Old Alloy No. 100  
New Alloy No. 110

Thickness (in inches)	Size in inches	Pounds per Sheet	Thickness (in inches)	Size in inches	Pounds per Sheet
8 OZ. (.0108)	30 X 60	6.25	48 OZ. (.0647)	30 X 60	38.00
	30 X 96	10.00		30 X 96	60.00
	36 X 96	12.00		36 X 96	72.00
10 OZ. (.0135)	30 X 60	7.81		48 X 72	72.00
	30 X 96	12.50		48 X 96	96.00
12 OZ. (.0162)	30 X 96	15.00		48 X 120	120.00
	36 X 96	18.00		60 X 120	150.00
14 OZ. (.0189)	30 X 96	17.50	52 OZ. (.0720)	30 X 96	66.77
	36 X 96	21.00	56 OZ. (.0755)	30 X 60	44.00
16 OZ. (.0216)	24 X 96	16.00		60 X 120	175.00
	24 X 120	20.00	58 OZ. (.0782)	30 X 96	72.50
	30 X 96	20.00	64 OZ. (.0863)	30 X 60	50.00
	30 X 120	25.00		48 X 96	128.00
	36 X 96	24.00		48 X 120	160.00
18 OZ. (.0243)	36 X 120	30.00	4 ½ LB. (.097)	48 X 72	108.00
	30 X 96	22.50		48 X 144	216.00
	36 X 96	27.00	5 LB. (.0178)	48 X 72	120.00
20 OZ. (.0270)	30 X 96	25.00	6 LB. (.1294)	48 X 72	144.00
	36 X 96	30.00		48 X 96	192.00
24 OZ. (.0323)	24 X 96	24.00		48 X 120	240.00
	30 X 96	30.00		48 X 144	288.00
	36 X 96	36.00		60 X 120	300.00
	48 X 96	48.00		72 X 120	360.00
32 OZ. (.0431)	30 X 96	40.00	9 LB. (.1941)	48 X 72	216.00
	36 X 96	48.00	12 LB. (.2588)	48 X 72	288.00
	48 X 120	80.00	3/32" (.0937)	36 X 96	104.27
36 OZ. (.0485)	36 X 96	54.00	1/8" (.1250)	36 X 96	139.10
	48 X 72	54.00	3/16" (.1875)	36 X 96	208.66
38 OZ. (.0513)	36 X 96	57.00	1/4" (.250)	36 X 96	278.21
40 OZ. (.0539)	30 X 60	31.00		48 X 120	463.68
	48 X 120	100.00		48 X 144	556.42
	60 X 120	125.00	3/8" (.3750)	30 X 60	217.35
44 OZ. (.0593)	30 X 96	55.00		48 X 120	695.52

STAINLESS STEEL

ROD • WIRE

TUBING • PIPE

HYDRAULIC TUBING  
STEEL

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SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

# COPPER

## COLD ROLLED COPPER SHEET — FLAT

Old Alloy No. 100  
New Alloy No. 110

Thickness (in inches)	Size in inches	Pounds per Sheet	Thickness (in inches)	Size in inches	Pounds per Sheet
8 OZ. (.0108)	24 X 96	8.00	24 OZ. (.0323)	48 X 96	48.00
	30 X 96	10.00	32 OZ. (.0431)	30 X 96	40.00
10 OZ. (.0135)	30 X 96	12.52		36 X 96	48.00
	36 X 96	15.00		48 X 96	64.00
12 OZ. (.0162)	30 X 96	15.00		48 X 120	79.94
	36 X 96	18.00	36 OZ. (.0485)	36 X 96	54.00
14 OZ. (.0189)	30 X 96	17.50	38 OZ. (.0512)	36 X 96	57.00
	36 X 96	21.00	40 OZ. (.0539)	48 X 120	100.00
16 OZ. (.0216)	10 X 96	6.68		60 X 120	125.00
	12 X 96	8.01	48 OZ. (.0647)	30 X 96	60.00
	12 X 120	10.00		36 X 96	72.00
	14 X 96	9.33		48 X 96	72.00
	15 X 96	10.01		48 X 120	120.00
	15 X 120	12.5		60 X 144	180.00
	18 X 96	12.00	64 OZ. (.0863)	60 X 144	240.00
	18 X 120	15.03	.093	36 X 96	103.49
18 OZ. (.0243)	20 X 96	13.34		48 X 96	137.99
	24 X 96	16.00	4½ LB. (.097)	12 X 144	54.00
	24 X 120	20.00	5 LB (.1078)	60 X 144	300.00
	30 X 96	20.00	6 LB (.1294)	12 X 144	72.00
	30 X 120	25.00		60 X 144	360.00
	36 X 96	24.00	⅛" (.1250)	36 X 96	139.10
	36 X 120	30.00		48 X 96	185.47
			⅜" (.1875)	36 X 96	208.66
20 OZ. (.0270)	30 X 96	22.50	¼" (.2500)	12 X 144	144.00
	36 X 96	27.00		36 X 96	278.16
22 OZ. (.0307)	30 X 96	25.00	⅝" (.3125)	12 X 144	180.00
	36 X 96	30.00	¾" (.3750)	12 X 144	216.00
24 OZ. (.0323)	24 X 96	24.00	½" (.5000)	12 X 144	288.00
	30 X 96	30.00		30 X 96	463.68
	36 X 96	36.00			
	36 X 120	45.00			

## COLD ROLLED COPPER SHEET

Tinned One Side  
Old Alloy No. 100  
New Alloy No. 110

Thickness (in inches)	Size in inches	Pounds per Sheet
24 OZ. (.0323)	36 X 96	36.00
32 OZ. (.0431)	48 X 96	48.00

# COPPER

## LEAD COATED COPPER SHEET

Flat, Hot Rolled\*  
Lead Coated Both Sides

Thickness (in inches)	Size in inches	Approx. Weight per Sheet
16 OZ. (.0216)	30 X 96	20 LBS.
	36 X 96	24 LBS.
	36 X 120	30 LBS.

Approximate weight of lead per 100 square feet for both sides, 12 to 15 pounds.

\*Can also be furnished Cold Rolled.



## COPPER ROUND ROD — HARD DRAWN



Old Alloy No. 100  
New Alloy No. 110  
12 Foot Mill Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
1/8	.0474	* 5/8	1.185	1 3/8	5.738
3/16	.1067	1 1/16	1.434	1 1/2	6.828
1/4	.1897	3/4	1.707	1 3/4	9.294
5/16	.2964	1 3/16	2.003	2	12.14
3/8	.4268	7/8	2.324	2 1/4	15.36
7/16	.5809	1	3.035	2 1/2	18.97
1/2	.7587	1 1/8	3.841	3	27.31
9/16	.9602	1 1/4	4.742		

\*Also available in Leaded Copper.



## COPPER SQUARE BAR — BUS BAR TEMPER



Old Alloy No. 100  
New Alloy No. 110  
12 Foot Mill Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
3/16	.1358	1/2	.9660	1 1/4	6.038
1/4	.2415	5/8	1.509	1 1/2	8.694
5/16	.3773	3/4	2.174	2	15.46
3/8	.5434	1	3.864		

STAINLESS STEEL

ROD • WIRE

TUBING • PIPE

HYDRAULIC TUBING  
STEEL

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

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# COPPER

## COPPER RECTANGULAR WIRE AND STRIP

Hard Alloy No. 100  
New Alloy No. 110  
Square Edge  
12 Foot Mill Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{16} \times \frac{1}{4}$	.0604	$\frac{1}{16} \times \frac{3}{4}$	.1811	$\frac{3}{32} \times \frac{3}{4}$	.257
$\frac{1}{8}$	.1208	1	.2415	1	.363
$\frac{5}{8}$	.1509	$\frac{3}{32} \times \frac{1}{2}$	.182	$1 \frac{1}{4}$	.4528
		$\frac{5}{8}$	.2264		

## COPPER RECTANGULAR BAR — BUS BAR TEMPER

Square Edge  
Old Alloy No. 100  
New Alloy No. 110  
12 Foot Random Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{8} \times \frac{3}{8}$	.1812	$\frac{1}{4} \times \frac{3}{4}^*$	.7245	$\frac{3}{8} \times 4$	5.796
$\frac{1}{2}$	.2415	$\frac{7}{8}$	.845	6	8.694
$\frac{5}{8}$	.3019	1 *	.9660	$\frac{1}{2} \times \frac{3}{4}$	1.45
$\frac{3}{4}$	.3623	$1 \frac{1}{4}$	1.208	1	1.932
$\frac{7}{8}$	.4226	$1 \frac{1}{2}^*$	1.449	$1 \frac{1}{4}$	2.415
1	.4830	$1 \frac{3}{4}$	1.691	$1 \frac{1}{2}$	2.898
$1 \frac{1}{4}$	.6038	2 *	1.932	2	3.864
$1 \frac{1}{2}$	.7245	$2 \frac{1}{4}$	2.174	$2 \frac{1}{2}$	3.62
$1 \frac{3}{4}$	.8453	$2 \frac{1}{2}$	2.415	3	5.796
2	.9660	3 *	2.898	$3 \frac{1}{2}$	6.762
$2 \frac{1}{2}$	1.208	$3 \frac{1}{2}^*$	3.38	4	7.728
3	1.449	4 *	3.864	5	9.660
4	1.932	5 *	4.830	6	11.59
$\frac{3}{16} \times \frac{1}{2}^*$	.3623	6 *	5.796	8	15.46
$\frac{5}{8}^*$	.4528	$\frac{5}{16} \times 2$	2.415	$\frac{3}{4} \times 1 \frac{1}{2}$	4.34
$\frac{3}{4}^*$	.5434	$\frac{3}{8} \times \frac{1}{2}$	.7245	2	5.796
$\frac{7}{8}$	.6339	$\frac{3}{4}$	1.087	6	17.39
1	.7245	1	1.449	1 $\times$ 2	7.728
$1 \frac{1}{4}$	.9056	$\frac{3}{8} \times 1 \frac{1}{2}$	2.174	$2 \frac{1}{4}$	8.694
$1 \frac{1}{2}$	1.087	2	2.898	$2 \frac{1}{2}$	9.660
$1 \frac{3}{4}$	1.268	$2 \frac{1}{2}$	3.623	3	11.59
$\frac{3}{16} \times 2$	1.449	3	4.347	5	19.32
$\frac{1}{4} \times \frac{1}{2}^*$	.4830	$3 \frac{1}{2}$	5.087		
$\frac{5}{8}^*$	.6038				

\*Also available with round edge.

# COPPER

## COPPER ROUND WIRE — SOFT

Old Alloy No. 100  
New Alloy No. 110

B&S Gauge	Size in inches	Feet per Pound	B&S Gauge	Size in inches	Feet per Pound	B&S Gauge	Size in inches	Feet per Pound
26	.016	1300.0	18	.0403	203.4	10	.102	31.82
24	.020	817.7	17	.045	161.3	8	.128	20.01
23	.023	666.7	16	.051	127.9	6	.162	12.58
22	.025	514.2	14	.064	80.44	4	.203	7.914
20	.032	323.4	12	.080	50.01	1/4"	.250	5.29
19	.036	256.5	11	.093	40.12			

## COPPER TUBING HARD DRAWN Outside Diameter Sizes

Round, Seamless  
12 Foot Mill Lengths  
Old Alloy No. 103  
New Alloy No. 122

I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
3/16	.032	.061	1 1/2	.065	1.140
1/4	.035	.092		.083	1.43
	.042	.166	1 5/8	.083	1.55
5/16	.035	.119	1 3/4	.095	1.915
3/8	.042	.170	2	.065	1.530
7/16	.042	.202		.083	1.940
1/2	.032	.182	2 1/2	.065	1.930
	.049	.269		.109	3.170
5/8	.049	.343	3	.083	2.95
3/4	.058	.488	3 1/2	.083	3.45
7/8	.058	.576	4	.083	3.96
	.065	.641		.134	6.30
1	.035	.411	4 1/2	.134	7.12
	.065	.739	5	.065	3.90
1 1/8	.065	.838	6	.134	9.56
1 1/4	.072	1.030			

### 20 FOOT LENGTHS

3/8	.065	.246	3/4	.065	.542
1/2	.065	.344	1 1/4	.125	1.00
5/8	.065	.443			

STAINLESS STEEL

ROD • WIRE

TUBING • PIPE

HYDRAULIC TUBING  
STEEL

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

# COPPER

## COPPER TUBING HARD DRAWN Inside Diameter Sizes

Round, Seamless  
20 Foot Mill Lengths  
Old Alloy No. 103  
New Alloy No. 122

I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
1¼	.109	1.80	3½	.109	4.79
	.134	2.25	4	.083	4.12
1½	.134	2.67		.134	6.74
2	.065	1.63	4½	.134	7.56
	.083	2.11	5	.134	8.37
	.134	3.48	6	.134	9.99
	.165	4.34	7	.109	9.439
2½	.109	3.46	8	.109	10.75
3	.065	2.42		.134	13.27
	.083	3.12		.165	16.40
	.109	4.12			
	.134	5.11			

## TYPE "K" WATER TUBING — SOFT

Old Alloy No. 103  
New Alloy No. 122

60 Foot Coils

Nominal Size (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
¼	.375	.305	.035	.145
⅜	.500	.402	.049	.269
½	.625	.527	.049	.344
⅝	.750	.652	.049	.418
¾	.875	.745	.065	.641
1	1.125	.995	.065	.839
1¼	1.375	1.245	.065	1.04
1½	1.625	1.481	.072	1.36

20 Foot Straight Lengths

Nominal Size (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
2	2.125	1.959	.083	2.06
2½	2.625	2.435	.095	2.93
3	3.125	2.907	.109	4.00
3½	3.625	3.385	.120	5.12



# COPPER

## TYPE "K" WATER TUBING — HARD

Old Alloy No. 103  
New Alloy No. 122  
20 Foot Lengths

Nominal Size (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
1/4	.375	.277	.035	.134
3/8	.500	.402	.049	.269
1/2	.625	.527	.049	.344
5/8	.750	.652	.049	.418
3/4	.875	.745	.065	.641
1	1.125	.995	.065	.839
1 1/4	1.375	1.245	.065	1.04
1 1/2	1.625	1.481	.072	1.36
2	2.125	1.959	.083	2.06
2 1/2	2.625	2.435	.095	2.92
3	3.125	2.907	.109	4.00
3 1/2	3.625	3.385	.120	5.12
4	4.125	3.857	.134	6.51
5	5.125	4.805	.160	9.67
6	6.125	5.741	.192	13.87

## TYPE "L" WATER TUBING — SOFT

Old Alloy No. 103  
New Alloy No. 122

60 Foot Coils

Nominal Size (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
1/4	.375	.315	.030	.126
3/8	.500	.430	.035	.198
1/2	.625	.545	.040	.285
5/8	.750	.622	.049	.418
3/4	.875	.785	.045	.455

20 Foot Straight Lengths

Nominal Size (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
1	1.125	1.025	.050	.655
1 1/4	1.375	1.265	.055	.884
1 1/2	1.625	1.505	.060	1.14

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MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

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# COPPER

## TYPE "L" WATER TUBING — HARD

Old Alloy No. 103  
New Alloy No. 122  
20 Foot Lengths

Nominal Size (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
1/4	.375	.315	.030	.126
3/8	.500	.430	.035	.198
1/2	.625	.545	.040	.285
5/8	.750	.666	.042	.362
3/4	.875	.785	.045	.455
1	1.125	1.025	.050	.655
1 1/4	1.375	1.265	.055	.884
1 1/2	1.625	1.505	.060	1.14
2	2.125	1.985	.070	1.75
2 1/2	2.625	2.465	.080	2.48
3	3.125	2.945	.090	3.33
4	4.125	3.905	.110	5.38
5	5.125	4.875	.125	7.61
6	6.125	5.845	.140	10.20

## TYPE "M" WATER TUBING — HARD

20 Foot Lengths  
Old Alloy No. 103  
New Alloy No. 122

Nominal Size (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
3/8	.500	.450	.025	.145
1 1/4	1.375	1.291	.042	.682
1 1/2	1.625	1.527	.049	.940
2	2.125	2.009	.058	1.46
2 1/2	2.625	2.495	.065	2.03
3	3.125	2.981	.072	2.68
3 1/2	3.625	3.459	.083	3.58
4	4.125	3.935	.095	4.66
5	5.125	4.907	.109	6.66
6	6.125	5.881	.122	8.92
8	8.125	7.785	.170	16.5
10	10.125	9.701	.212	25.6

# COPPER

## COPPER DRAINAGE TUBING

Alloy No. 122

Nominal Size (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
1 1/4	1.375	1.295	.040	.65
1 1/2	1.625	1.541	.042	.809
2	2.125	2.041	.042	1.07
3	3.125	3.035	.045	1.69
4	4.125	4.009	.058	2.87
5	5.125	4.981	.072	4.43
6	6.125	5.959	.083	6.10

## COPPER REFRIGERATION TUBING

50 Foot Coils  
Sealed and Dehydrated  
Bulk Packed

Old Alloy No. 103  
New Alloy No. 122

O.D. (in inches)	Wall (in inches)	Weight per 50 Ft. Coil	O.D. (in inches)	Wall (in inches)	Weight per 50 Ft. Coil
1/8	.030	1.75	3/8	.032	6.70
3/16	.030	2.90	1/2	.032	9.10
1/4	.030	4.00	5/8	.035	12.60
5/16	.032	5.45	3/4	.035	15.25

## COPPER REFRIGERATION TUBING

50 Foot Coils  
Sealed and Dehydrated  
Individually Packaged  
1 Coil per Carton

Old Alloy No. 103  
New Alloy No. 122

O.D. (in inches)	Wall (in inches)	Weight per 50 Ft. Coil	O.D. (in inches)	Wall (in inches)	Weight per 50 Ft. Coil
1/8	.035	1.90	7/16	.035	8.60
3/16	.035	3.25	1/2	.035	9.90
1/4	.035	4.60	5/8	.035	12.50
5/16	.035	5.90	3/4	.035	15.25
3/8	.035	7.25			

STAINLESS STEEL

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FOUNDRY • WELDING  
BRAZING PRODUCTS



# COPPER

## SOFT COPPER TUBING — SEAMLESS

50 Foot Coils  
Open ends  
For Automotive,  
Oil Burner, and  
General Use  
Old Alloy No. 103  
New Alloy No. 122

O.D. (in inches)	Wall (in inches)	Weight per 50 Ft. Coil	O.D. (in inches)	Wall (in inches)	Weight per 50 Ft. Coil
$\frac{1}{8}$	.032	1.81		.049	9.75
	.035	1.92	$\frac{3}{8}$	.065	12.25
$\frac{3}{16}$	.032	3.03		.094 *	10.63 †
	.035	3.25	$\frac{1}{2}$	.035	9.90
$\frac{1}{4}$	.032	4.25		.049	13.45
	.035	4.58		.065	17.20
$\frac{5}{16}$	.032	5.45		.094	22.00
	.035	5.90	$\frac{3}{4}$	.035	15.25
$\frac{3}{8}$	.032	6.70	1	.035	20.55
	.035	7.25			

\*33 foot Coil.

†Weight of 33 foot Coil.

## COPPER TUBING — HARD DRAWN

Round  
12-14 Foot Random Lengths  
Old Alloy No. 103  
New Alloy No. 122

O.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot	O.D. (in Inches)	Wall (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$	.032	.036	$1\frac{3}{4}$	.120	2.38
$\frac{3}{8}$	.032	.134	$1\frac{3}{4}$	.125	2.47
$\frac{3}{8}$	.035	.118	2	.065	1.53
$\frac{1}{2}$	.065	.344	2	.083	1.94
$\frac{5}{8}$	.065	.443	$2\frac{1}{8}$	.065	1.63
$\frac{5}{8}$	.083	.548	$2\frac{1}{4}$	.134	3.45
$\frac{3}{4}$	.065	.542	4	.065	3.12
1	.065	.740	$5\frac{9}{16}$	.068	4.55

# COPPER

## COPPER PIPE

12 and 20 Foot Lengths  
Old Alloy No. 103  
New Alloy No. 122

S.P.S. (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
1/8	.405	.281	.062	.259
1/4	.540	.376	.082	.457
3/8	.675	.495	.090	.641
1/2	.840	.626	.107	.955
3/4	1.050	.822	.114	1.30
1	1.315	1.063	.126	1.82
1 1/4	1.660	1.368	.146	2.69
1 1/2	1.900	1.600	.150	3.20
2	2.375	2.063	.156	4.22
2 1/2	2.875	2.501	.187	6.12
3	3.500	3.062	.219	8.75
3 1/2	4.000	3.500	.250	11.4
4	4.500	4.000	.250	12.94
5	5.562	5.062	.250	16.20
6	6.625	6.125	.250	19.41
8	8.625	8.001	.312	31.63

## EXTRA HEAVY COPPER PIPE

12 Foot Lengths  
Old Alloy No. 103  
New Alloy No. 122

S.P.S. (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
1/8	.405	.205	.100	.371
1/4	.540	.294	.123	.625
3/8	.675	.421	.127	.847
1/2	.840	.542	.149	1.25
3/4	1.050	.736	.157	1.71
1	1.315	.951	.182	2.51
1 1/4	1.660	1.272	.194	3.46
1 1/2	1.900	1.494	.203	4.19
2	2.375	1.933	.221	5.80
2 1/2	2.875	2.315	.280	8.85
3	3.500	2.892	.304	11.8
4	4.500	3.818	.341	17.3
5	5.562	4.812	.375	23.7
6	6.625	5.751	.437	32.9
8	8.625	7.625	.500	49.5

## COPPER ANODES

Copper anodes can be supplied in a wide range of thicknesses, widths and lengths. They can be furnished flat or oval, drilled or plain. Please write or telephone for complete information.

STAINLESS STEEL

HYDRAULIC TUBING  
STEEL

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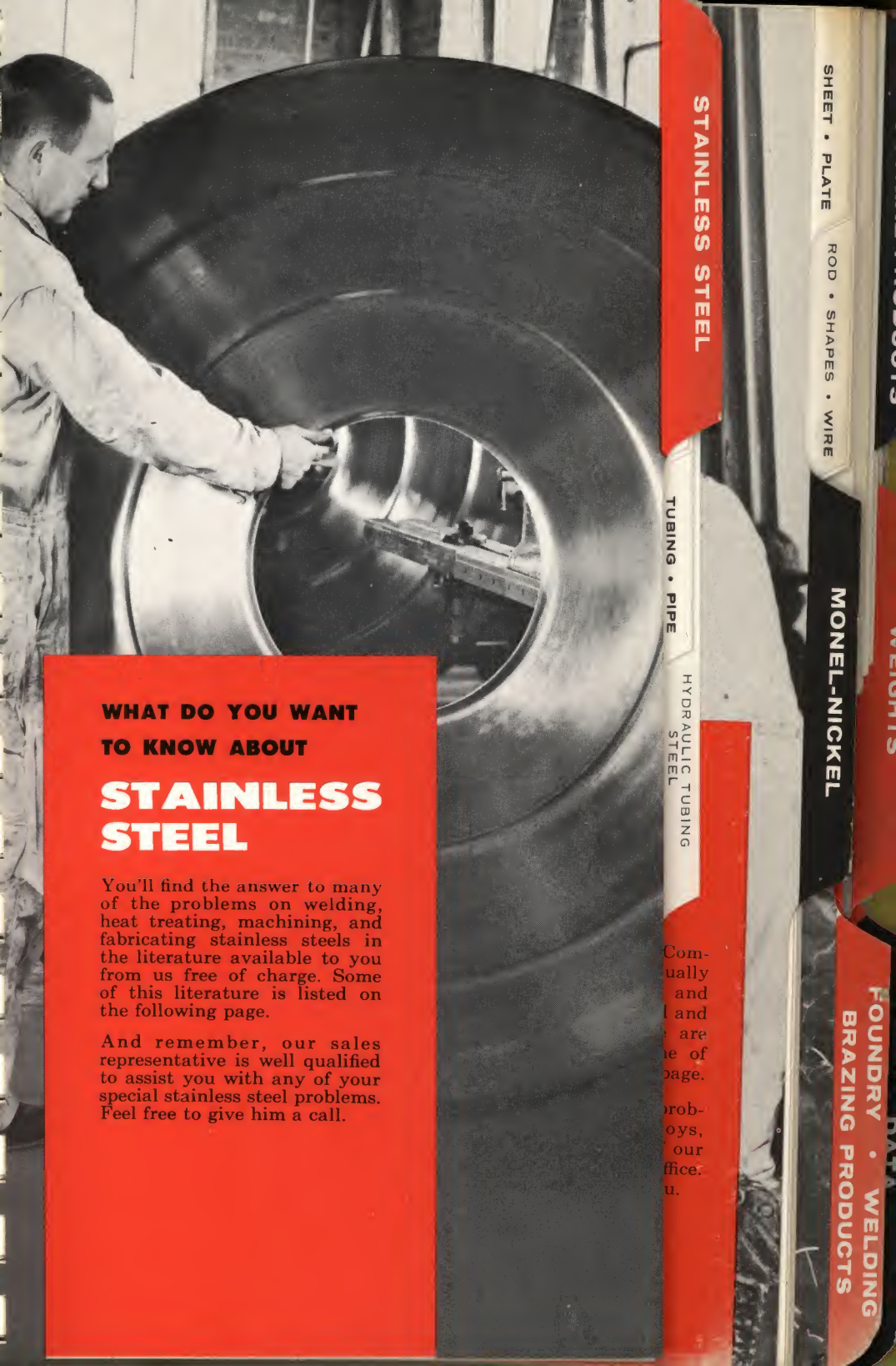
# COPPER

## COPPER and COPPER ALLOYS

### Old and New Alloy Designations

Old Alloy No.	New Alloy No.	Old Alloy No.	New Alloy No.	Old Alloy No.	New Alloy No.
2	2101	239	3481	448	462
4	210	241	3471	450	464
7	DROPPED	243	353	452	4641
14	220	244	350	474	405
21	226	245	3531	477	4221
24	230	246	3532	481	470
29	234	247	3651	510	667
32	240	250	377	515	6670
37	250	257	331	602	DROPPED
40	2501	260	3713	603	4761
42	260	262	3711	605	482
43	DROPPED	267	320	607	DROPPED
44	2611	269	348	610	544
45	261	270	3712	612	485
51	262	271	360	702	715
58	270	274	365	704	7151
59	268	278	3801	707	7152
60	2681	280	385	712	7101
61	274	282	332	713	710
65	2802	286	316	716	735
66	280	293	371	719	752
68	2801	301	509	721	7641
100	110	302	5090	724	770
101	125	303	5091	736	7091
103	122	305	510	739	754
104	120	314	5092	741	7622
107	DROPPED	320	5181	742	762
108	142	322	532	743	766
109	DROPPED	351	510	744	757
110	1161	353	521	745	7921
111	113	354	524	748	707
112	114	356	505	749	7401
113	116	358	5014	750	740
117	1171	361	507	751	745
119	DROPPED	363	5012	755	706
120	102	364	5072	758	7902
121	101	365	5073	760	7821
122	104	366	5071	763	7051
123	107	367	5070	766	704
124	1101	368	5020	767	7041
126	187	372	189	787	702
127	145	379	534	795	7901
128	DROPPED	404	413	821	7761
129	1870	410	411	823	7741
130	1102	411	4191	825	7981
132	147	412	415	828	773
134	150	419	4111	831	7021
201	310	420	4222	850	7321
202	314	421	4301	925	DROPPED
205	3201	422	430	958	162
218	330	435	435	959	1620
220	3301	436	436	960	1621
223	3302	439	443	961	1622
226	335	440	444	965	165
229	340	441	445	999	182
235	342	442	442		
238	356	444	DROPPED		





SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

STAINLESS STEEL

TUBING • PIPE

HYDRAULIC TUBING  
STEEL

**WHAT DO YOU WANT  
TO KNOW ABOUT**

## **STAINLESS STEEL**

You'll find the answer to many of the problems on welding, heat treating, machining, and fabricating stainless steels in the literature available to you from us free of charge. Some of this literature is listed on the following page.

And remember, our sales representative is well qualified to assist you with any of your special stainless steel problems. Feel free to give him a call.

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# STAINLESS STEEL

Stocks change from time to time. If the material you want is not listed here, call or write our office nearest you for additional information.

## LITERATURE ON STAINLESS STEEL

Literature is free, and may be had by calling our representative, or writing our nearest warehouse sales office.

- Cleaning of Stainless Steel
- Stainless Steels
- Stainless Steel Sheets, Strips, Plates
- Stainless Steel Bar and Wire
- Here's the Stainless Bar Grade You Want
- What Grade of Stainless Sheets Will Do Your Job
- Precipitation-Hardening Stainless Steels
- ELC Stainless Steels
- Welding and Soldering of Stainless Steels
- Machining of Stainless Steels
- Surface Finishing of Stainless Steel
- Heat Treating, Forging and Pickling of Stainless Steels
- Stainless Fabricating Tips
- Stainless Steel Pipe and Tube

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- New York, New York
- .....WOrth 4-2800
- Carteret, N. J. ....YOrktown 9-2000
- Cambridge, Mass.
- .....TRowbridge 6-4680
- Harrison N. J. ....HUmboldt 5-5900
- Philadelphia, Pa. ....BAlwin 9-2323
- Baltimore, Md. ....WIndsor 4-2000
- Buffalo, N. Y. ....TRiangle 6-3100
- Syracuse, N. Y. ....HOWard 3-6241
- Windsor, Conn. ....phone 688-4921
- Rochester, N. Y. ....BUtler 8-2141



# STAINLESS STEEL SHEET WEIGHT TABLE

Pounds per  
Square Foot

SHEET • PLATE

BAR • WIRE

TUBING • PIPE

HYDRAULIC TUBING  
STEEL

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

ESTIMATED WEIGHTS ARE BASED ON CHROMIUM NICKEL  
STAINLESS STEEL—42.0 lbs. per sq. ft., per inch of thickness

Nominal Gauge U.S.S.	Thickness Range Dec. Inch	Nominal Thickness Dec. Inch	Nominal Weight Pounds Per Square Foot	Continuous Mill* Rolling Thickness Dec. Inch	Continuous Mill Weight* Pounds Per Square Foot
8	.1874 - .1601	.1719	7.2188		
9	.1600 - .1451	.1563	6.5625		
10	.1450 - .1301	.1406	5.9062		
-	-	.135	5.670		
11	.1300 - .1141	.125	5.25	.120	5.0388
12	.1140 - .0981	.1094	4.5937	.105	4.4090
13	.0980 - .0831	.0938	3.9375	.090	3.7791
14	.0830 - .0721	.0781	3.2812	.075	3.1493
15	.0720 - .0651	.0703	2.9531		
16	.0650 - .0581	.0625	2.625	.0595	2.4894
17	.0580 - .0521	.0563	2.3625		
18	.0520 - .0461	.05	2.10	.048	2.0155
19	.0460 - .0401	.0438	1.8375	.042	1.7636
-	-	.040	1.648		
20	.0400 - .0351	.0375	1.575	.0355	1.4906
-	-	.036	1.512		
-	-	.035	1.470		
21	.0350 - .0321	.0344	1.4438		
22	.0320 - .0291	.0313	1.3125	.029	1.2177
-	-	.030	1.260		
23	.0290 - .0261	.0281	1.1813		
24	.0260 - .0231	.0250	1.05	.0235	.9868
-	-	.024	1.008		
25	.0230 - .0199	.0219	.9188		
-	-	.020	.824		
26	.0198 - .0178	.0188	.7875	.0177	.7432
-	-	.018	.756		
-	-	.0161	.659		
28	.0160 - .0146	.0156	.6562	.0145	.6089
30	.0130 - .0115	.0125	.5250		

\*Stainless Steel sheets, 11 gauge and lighter, 48 inches wide and narrower, are regularly produced on continuous rolling mills which are capable of maintaining closer tolerances than hand mills. This has brought about a change in mill ordering practices.

## WHEN ORDERING SHEET BY GAUGE NUMBER

Material ordered within the continuous mill range should be expected to be supplied according to the thickness and weight per square foot shown in the table and within the gauge thickness range.

## WHEN ORDERING SHEET BY DECIMAL THICKNESS

Material thus ordered should be expected to be supplied with the full thickness tolerances applying as shown on the following page.

**NOTE:** For a comparison of gauges expressed in decimals of an inch, refer to table in data section.

Weights are theoretical and may vary from actual. See tolerances on next page.

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# STAINLESS STEEL

## STANDARD TOLERANCES

Stainless Steel Sheets

### THICKNESS TOLERANCES

All Finishes — 48 Inches Wide or Narrower

Hand Mill		Continuous Mill	
Ordered Thickness in inches	Tolerance Plus or Minus in inches	Ordered Thickness in inches	Tolerance Plus or Minus in inches
.0581 - .072	.006	.005 - .0059	.001
.0721 - .083	.007	.006 - .029	.0015
.0831 - .098	.008	.0291 - .040	.002
.0981 - .114	.009	.0401 - .072	.003
.1141 - .130	.010	.0721 - .098	.004
.1301 - .145	.012	.0981 - .130	.005
.1451 - .1874	.014	.1301 - .145	.006
		.1451 - 1874	.007

### WEIGHT TOLERANCES

The actual weight of any one item of an ordered thickness and size in any finish is limited in overweight by the following tolerances:

- 1 Any item of five sheets or less, or any item estimated to weigh 200 pounds or less, may actually weigh as much as 10% over the theoretical weight.
- 2 Any item of more than five sheets and estimated to weigh more than 200 pounds may actually weigh as much as 7½% over the theoretical weight.

There is no under-tolerance in weight for No. 1 and No. 2 finishes, these finishes being limited in under-tolerance only by the permissible thickness variations. Polished sheets may actually weigh as much as 5% less than the theoretical weight.

For determining estimated weight the following factors are to be used:

**Chromium Nickel Stainless Sheets** . . . . . 42.0 lbs. per sq. ft. per inch of thickness.

**Straight Chromium Stainless Steel Sheets** . . . 41.2 lbs. per sq. ft. per inch of thickness.

### WIDTH TOLERANCES

48" and Under . . . . . 1/16" over, nothing under  
Over 48" . . . . . 1/8" over, nothing under

### LENGTH TOLERANCES

120" and Under . . . . . 1/16" over, nothing under  
Over 120" . . . . . 1/8" over, nothing under

# STAINLESS STEEL

## STANDARD TOLERANCES

Stainless Cold Rolled Strip

### THICKNESS TOLERANCES

Specified Thickness, Inch	Thickness tolerance, in., over and under, for thicknesses and widths given						
	Widths, Inches						
	Under 1 to $\frac{3}{16}$ Incl.	Under 3 to 1 Incl.	3 to 6 Incl.	Over 6 to 9 Incl.	Over 9 to 12 Incl.	Over 12 to 16 Incl.	Over 16 to $23\frac{15}{16}$ Incl.
.1874 TO .161 INCL.	.002	.003	.004	.004	.004	.005	.006
.160 TO .100 INCL.	.002	.002	.003	.004	.004	.004	.005
.099 TO .0721 INCL.	.002	.002	.003	.003	.003	.004	.004
.072 TO .050 INCL.	.002	.002	.003	.003	.003	.003	.003
.049 TO .0401 INCL.	.002	.002	.0025	.003	.003	.003	.003
.040 TO .035 INCL.	.002	.002	.002	.002	.002	.002	.002
.034 TO .0291 INCL.	.0015	.0015	.002	.002	.002	.002	.002
.029 TO .026 INCL.	.001	.0015	.0015	.0015	.0015	.0015	.0015
.025 TO .020 INCL.	.001	.001	.0015	.0015	.0015	.0015	.0015
.019 TO .013 INCL.	.001	.001	.001	.0015	.0015	.0015	.0015
.012—	.001	.001	.001	.001	.0015	.0015	.0015
.011—	.001	.001	.001	.001	.001	.0015	.0015
.010—	.001	.001	.001	.001	.001	.001	.0015

**NOTE:** (1) For thicknesses under 0.010 to .005 incl. in widths up to and including 16 inches, a permissible variation of plus or minus 10% of the thickness is to apply. For thicknesses under 0.010 to .005 incl. widths over 16 inches to  $23\frac{15}{16}$  inches incl., a permissible variation of plus or minus 15% of the thickness is to apply.

(2) Thickness measurements are taken  $\frac{3}{8}$  in. in from edge of the strip, except on widths less than 1 in. the tolerances are applicable for measurements at all locations.

### WIDTH TOLERANCES

#### Number 3 Edge

Specified Thickness, Inch	Width tolerance, in., over and under, for thicknesses and widths given					
	Widths, Inches					
	Under $\frac{1}{2}$ to $\frac{3}{16}$ Incl.	$\frac{1}{2}$ to 6 Incl.	Over 6 to 9 Incl.	Over 9 to 12 Incl.	Over 12 to 20 Incl.	Over 20 to $23\frac{15}{16}$ Incl.
.1874 TO .161 INCL.	—	.016	.020	.020	.031	.031
.160 TO .100 INCL.	.010	.010	.016	.016	.020	.020
.099 TO .069 INCL.	.008	.008	.010	.010	.016	.020
.068 AND UNDER	.005	.005	.005	.010	.016	.020

BAR • WIRE

TUBING • PIPE

HYDRAULIC TUBING  
STEEL

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

BRAZING PRODUCTS

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# STAINLESS STEEL

## TYPE 301— $\frac{1}{4}$ HARD TEMPER SHEET

Thickness (in inches)	Size (in inches)	Pounds per Sheet
.0625	36 X 96	63.1
	36 X 120	78.8
.050	36 X 120	63.0
.040	36 X 120	50.4
.035	36 X 120	43.3

## TYPE 301— $\frac{1}{2}$ HARD TEMPER SHEET

Thickness (in inches)	Size (in inches)	Pounds per Sheet
.0625	36 X 120	78.8
.050	36 X 120	63.0
.040	36 X 120	50.4

## TYPE 302-304 SHEET

Thickness (in inches)	Size in inches	Pounds per Sheet
.1406 (10 GA.)	48 X 120	236.2
.120 (11 GA.)	36 X 120	151.1
	48 X 120	201.5
.105 (12 GA.)	36 X 96	105.8
	36 X 120	132.2
	42 X 120	154.3
	48 X 120	176.3
.075 (14 GA.)	30 X 120	78.7
	36 X 96	75.5
	36 X 120	94.4
	42 X 120	110.2
	48 X 120	125.9
	60 X 120 *	164.1
.060 (16 GA.)	30 X 96	49.9
	30 X 120	62.4
	36 X 96	59.7
	36 X 120	74.9
	36 X 144	89.9
	48 X 96	79.9
	48 X 120	99.9
	48 X 144	119.9
.048 (18 GA.)	30 X 96	40.3
	30 X 120	50.3
	36 X 96	48.3
	36 X 120	50.4
	48 X 96	64.4

## 2B Cold Rolled Finish, Aircraft Quality

Thickness (in inches)	Size (in inches)	Pounds per Sheet
.032	36 X 120	40.3
	36 X 96	31.5
.031	36 X 120	39.4
.025	36 X 120	31.5
.020	36 X 120	27.5
.016	36 X 120	20.2

## 2B Cold Rolled Finish, Aircraft Quality

Thickness (in inches)	Size (in inches)	Pounds per Sheet
.036	36 X 120	46.3
.031	36 X 120	39.4
.025	36 X 120	31.5
.020	36 X 120	27.5

## No. 4 Polish One Side, Annealed

Thickness (in inches)	Size in inches	Pounds per Sheet
.048 (18 GA.)	48 X 120	80.6
.036 (20 GA.)	30 X 96	29.8
	30 X 120	37.2
	36 X 96	35.7
	36 X 120	44.7
	48 X 96	47.6
	48 X 120	59.6
.029 (22 GA.)	30 X 96	24.3
	30 X 120	30.4
	36 X 96	29.2
	36 X 120	36.5
	48 X 96	38.9
	48 X 120	48.7
.024 (24 GA.)	30 X 96	19.7
	30 X 120	24.6
	36 X 96	23.6
	36 X 120	29.6
	48 X 96	31.5
	48 X 120	39.4
.018 (26 GA.)	30 X 96	14.8
	30 X 120	18.5
	36 X 96	17.8
	36 X 120	22.2
	48 X 120	29.7
.015 (28 GA.)	36 X 96	14.6

\*Supplied to nominal  
weight and thickness.



# STAINLESS STEEL

## TYPE 302-304 SHEET

2B Finish — Annealed,  
Pickled, and Cold Rolled

Thickness (in inches)	Size in inches	Pounds per Sheet	Thickness (in inches)	Size in inches	Pounds per Sheet
.1406 (10 GA.)	36 X 96	141.7	.060 (16 GA.)	60 X 120*	131.3
	36 X 120	177.2		60 X 144*	157.5
	48 X 120	236.2	.048 (18 GA.)	30 X 96	40.3
	60 X 120	295.3		30 X 120	50.3
	60 X 144	354.4		36 X 96	48.3
72 X 144	425.2	36 X 120		60.4	
.120 (11 GA.)	36 X 96	120.9		48 X 96	64.4
	36 X 120	151.1		48 X 120	80.6
	48 X 96	161.2	.042 (19 GA.)	36 X 120	52.9
	48 X 120	201.5		.040	36 X 120
	48 X 144	241.8	.036 (20 GA.)	24 X 120	29.8
	60 X 120*	262.5		30 X 96	29.8
	60 X 144*	315.0		30 X 120	37.2
.105 (12 GA.)	72 X 144*	378.0		36 X 96	35.7
	36 X 96	105.8		36 X 120	44.7
	36 X 120	132.2		48 X 96	47.6
	48 X 96	141.0		48 X 120	59.6
	48 X 120	176.3	.029 (22 GA.)	24 X 96	19.5
	48 X 144	211.6		30 X 96	24.3
	60 X 120*	229.7		30 X 120	30.4
	60 X 144*	275.6		36 X 96	29.2
	72 X 120*	275.6		36 X 120	36.5
	72 X 144*	330.8		48 X 96	38.9
.090 (13 GA.)	36 X 96	90.6		48 X 120	48.7
	36 X 120	113.3	.024 (24 GA.)	24 X 120	19.7
	48 X 120	151.1		30 X 96	19.7
.075 (14 GA.)	24 X 120	63.0			30 X 120
	30 X 96	62.9		36 X 96	23.6
	36 X 96	75.5		36 X 120	29.6
	36 X 120	94.4		48 X 96	31.5
	48 X 96	100.7		48 X 120	39.4
	48 X 120	125.9	.020	36 X 120	24.8
	48 X 144	151.1		.018 (26 GA.)	24 X 96
	60 X 120*	164.1	30 X 96		14.8
	60 X 144*	196.9			30 X 120
	.060 (16 GA.)	72 X 144*	236.3		36 X 96
30 X 96		49.9		36 X 120	22.2
30 X 120		62.4		48 X 96	23.7
36 X 96		59.7		48 X 120	29.7
36 X 120		74.9	.0161	36 X 120	20.3
48 X 96		79.9		.015 (28 GA.)	36 X 96
48 X 120		99.9	36 X 120		18.2
48 X 144		119.9			

\*Supplied to nominal weight and thickness.

BAR • WIRE

TUBING • PIPE

HYDRAULIC TUBING  
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SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

# STAINLESS STEEL

## TYPE 302 SHEET

Thickness (in inches)	Size in inches	Pounds per Sheet
.105 (12 GA.)	36 X 120	132.2
	48 X 120	176.3
	60 X 144	236.5
.075 (14 GA.)	36 X 120	94.4
	42 X 120	110.2
	48 X 96	100.7
	48 X 120	125.9
.060 (16 GA.)	36 X 96	59.7
	36 X 120	74.9
	48 X 96	79.9
	48 X 120	99.9
.048 (18 GA.)	30 X 96	40.3
	30 X 120	50.3
	36 X 96*	48.3
	36 X 120*	60.4
	48 X 96	64.4

## No. 3 (100 Grit)

### Polished One Side

Thickness (in inches)	Size in inches	Pounds per Sheet
.048 (18 GA.)	48 X 120	80.6
.0471	36 X 120	59.3
.036 (20 GA.)	36 X 96	35.7
	36 X 120	37.2
	48 X 96	47.6
	48 X 120	59.6
.0351	36 X 120	44.2
.029 (22 GA.)	36 X 96	29.2
	36 X 120	36.5
	48 X 120	48.7
.024 (24 GA.)	36 X 96	23.6
	36 X 120	29.6
.018 (26 GA.)	36 X 96	17.8
	36 X 120	22.2

\* Paper Protected

## TYPE 304L (EXTRA LOW CARBON) SHEET

Thickness (in inches)	Size in inches	Pounds per Sheet
.1406 (10 GA.)	48 X 120	236.5
.120 (11 GA.)	48 X 120	201.5
.105 (12 GA.)	36 X 96	105.8
	48 X 120	176.3

## 2B Finish — Annealed, Pickled, and Cold Rolled

Thickness (in inches)	Size in inches	Pounds per Sheet
.075 (14 GA.)	48 X 120	125.9
.060 (16 GA.)	48 X 120	99.9
.029 (22 GA.)	36 X 96	29.2

## TYPE 316 SHEET

Thickness (in inches)	Size in inches	Pounds per Sheet
.1406 (10 GA.)	36 X 120	177.2
	48 X 120	236.2
	60 X 144	354.4
.120 (11 GA.)	36 X 96	120.9
	36 X 120	151.1
	48 X 96	161.2
	48 X 120	201.5
	60 X 120*	262.5
	60 X 144*	315.0
.105 (12 GA.)	36 X 120	132.2
	48 X 120	176.3
	60 X 120*	229.7
	60 X 144*	275.6
.090 (13 GA.)	48 X 120	151.1
.075 (14 GA.)	36 X 96	75.5
	36 X 120	94.4
	48 X 120	125.9
	60 X 144*	129.9
.060 (16 GA.)	36 X 96	59.7

## 2B Finish — Annealed, Pickled, and Cold Rolled

Thickness (in inches)	Size in inches	Pounds per Sheet
.060 (16 GA.)	36 X 120	74.9
	48 X 96	79.9
	48 X 120	99.9
.048 (18 GA.)	60 X 144*	157.5
	36 X 96	48.3
	36 X 120	60.4
	48 X 96	64.4
.036 (20 GA.)	48 X 120	80.6
	36 X 96	35.7
	36 X 120	44.7
.029 (22 GA.)	48 X 120	59.6
	36 X 96	29.2
	36 X 120	36.5
.024 (24 GA.)	48 X 120	48.7
	36 X 96	23.6
	36 X 120	29.6
.018 (26 GA.)	48 X 120	39.4
	36 X 96	17.8
	36 X 120	22.2

\* Supplied to nominal weight and thickness.

# STAINLESS STEEL

## TYPE 316L (EXTRA LOW CARBON) SHEET

2B Finish — Annealed, Pickled, and Cold Rolled

Thickness (in inches)	Size in inches	Pounds per Sheet	Thickness (in inches)	Size in inches	Pounds per Sheet
.1406 (10 GA.)	48 X 120	236.2	.075 (14 GA.)	48 X 120	125.9
.120 (11 GA.)	48 X 120	201.5	.060 (16 GA.)	48 X 120	99.9
.105 (12 GA.)	48 X 120	176.3	.048 (18 GA.)	48 X 120	80.6

## TYPE 321 TITANIUM STABILIZED SHEET

Aircraft Quality  
2D Finish — Annealed, Pickled, and Cold Rolled

Thickness (in inches)	Size in inches	Pounds per Sheet	Thickness (in inches)	Size in inches	Pounds per Sheet
.125	36 X 120	157.5	.050	48 X 120	84.0
.090	36 X 120	113.4	.040	36 X 120	50.4
.080	36 X 120	100.8	.036	36 X 120	45.4
	48 X 120	105.8	.032	36 X 120	40.3
.050	36 X 96	50.5	.025	36 X 120	31.5
	36 X 120	63.0	.016	36 X 120	19.8

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SHEET • PLATE  
ROD • SHAPES • WIRE

MONEL-NICKEL

INDUSTRIAL PRODUCTS  
WEIGHTS  
FOUNDRY • WELDING  
BRAZING PRODUCTS



# STAINLESS STEEL

## PH STAINLESS STEEL SHEET GRADES

17-7 PH and PH 15-7 Mo are readily available in sheet form, and, to a limited extent, 17-4 PH is also available in sheet form. Contact your representative or the warehouse sales office nearest you for additional information.

### TYPE 410 (.080 MAXIMUM CARBON) SHEET

#### 2D Finish

Cold Rolled, Annealed & Pickled

Thickness (in inches)	Size (in inches)	Pounds per Sheet
.156	36 X 120*	192.8
.125	36 X 120	157.5
.1093	48 X 120	183.7
.0781	48 X 96	104.9

Thickness (in inches)	Size (in inches)	Pounds per Sheet
.0781	48 X 120	131.2
.0625	48 X 96	84.0
	48 X 120	105.0

\*No. 1 Finish, Hot Rolled, Annealed and Pickled.

### TYPE 430 SHEET

#### 2B Finish

Thickness (in inches)	Size (in inches)	Pounds per Sheet
.060 (16 GA.)	36 X 120	74.9
.036 (20 GA.)	36 X 96	35.7

Thickness (in inches)	Size (in inches)	Pounds per Sheet
.029 (22 GA.)	36 X 96	29.2
.024 (24 GA.)	36 X 96	23.6

### A-286\* SHEET

Thickness (in inches)	Size in inches	Pounds per Sheet
.125	24 X 96	84.15
.109	24 X 96	72.35
.090	24 X 96	60.45
	36 X 96	90.60
.080	24 X 96	52.75
.070	24 X 96	47.30

Thickness (in inches)	Size in inches	Pounds per Sheet
.060	24 X 96	39.95
.050	24 X 96	33.65
	36 X 96	50.50
.040	24 X 96	28.20
.030	24 X 96	19.45

\*Allegheeny-Ludlum Grade Designation

# STAINLESS STEEL

COILS  
BANDING STRIP  
RIGIDIZED SHEET  
PERFORATED SHEET  
EXPANDED SHEET

Stainless steels are available in these commercial forms. Call or write for information.

## STAINLESS STEEL PLATES — STANDARD TOLERANCES

### Thickness Tolerances for Rectangular Stainless Steel Plates

Plates must be ordered to thickness, not to weight per square foot. For purposes of production and shipment of plates within production size ranges, the thickness tolerances shown apply.

Specified Thickness (inches)	Thickness Tolerance — Over Variation*	
	Widths to 84 incl.	Widths over 84 to 120 incl.
3/16 TO 3/8 EXCL.	.046	.050
3/8 TO 1/2 EXCL.	.054	.058
1/2 TO 1 EXCL.	.060	.064
1 TO 2 INCL.	.070	.074
OVER 2	INQUIRE	INQUIRE

\*Spot grinding is permitted to remove surface imperfections. No plate, however, shall vary more than .01" under specified thickness.

### BILLING WEIGHTS Stainless Steel Plates

Decimal Thickness	Fraction of an inch	Pounds per Square Foot		
		Widths up to and incl. 84"	Widths over 84" to 96" incl.	Widths over 96"
.1875	3/16	7.985	8.295	8.566
.21875	7/32	9.315	9.677	9.994
.250	1/4	10.646	10.956	11.266
.3125	5/16	13.308	13.437	13.695
.375	3/8	15.968	16.123	16.433
.4375	7/16	18.630	18.810	19.172
.500	1/2	21.291	21.498	21.911
.5625	9/16	23.952	24.185	24.650
.625	5/8	26.614	26.614	27.002
.6875	11/16	29.276	29.276	29.702
.750	3/4	31.937	31.937	32.402
.8125	13/16	34.599	34.599	35.103
.875	7/8	37.260	37.260	37.803
.9375	15/16	39.922	39.922	40.503
1.000	1	42.582	42.582	43.202
1.250	1 1/4	53.228	53.228	54.004
1.500	1 1/2	63.873	63.873	64.804
1.750	1 3/4	74.519	74.519	75.605
2.000	2	85.164	85.164	86.405

Billing weights for thicknesses other than those shown will be furnished upon inquiry.

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TUBING • PIPE

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SHEET • PLATE

ROD • SHAPES • WIRE

INDUSTRIAL PRODUCTS

WEIGHTS

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

DATA

# STAINLESS STEEL

## STAINLESS STEEL PLATES

Alloys and Gauges Normally Carried in Stock  
indicated by "X"

Thickness (in inches)	TYPE 304	TYPE 304 ELC	TYPE 316	TYPE 316 ELC
$\frac{3}{16}$	X	X	X	X
$\frac{1}{4}$	X	X	X	X
$\frac{5}{16}$	X			
$\frac{3}{8}$	X	X	X	X
$\frac{1}{2}$	X		X	
$\frac{3}{4}$	X		X	
1			X	

All plates above are hot rolled, annealed and pickled, No. 1 Finish.

## STANDARD SIZES — BILLING WEIGHTS

Weight in Pounds Per Plate

Size (in inches)	Thickness of Plate in Inches						
	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
36 X 96	191.64	255.50	319.39	383.23	510.98	766.49	1021.97
36 X 120	239.55	319.38	399.24	479.04	638.73	958.11	1277.46
48 X 96	255.52	340.67	425.86	510.98	681.31	1021.98	1362.62
48 X 120	319.40	425.84	532.32	638.72	851.64	1277.48	1703.28
48 X 240	638.80	851.68	1064.64	1277.44	1703.28	2554.96	3406.56
60 X 120	399.25	532.30	665.40	798.40	1064.55	1596.85	2129.10
60 X 144	479.10	638.76	798.48	958.08	1277.46	1916.22	2554.92
60 X 240	798.50	1064.60	1330.80	1596.80	2129.10	3193.20	4258.20
72 X 120	479.10	638.76	798.48	958.08	1277.46	1916.22	2554.92
72 X 240	958.20	1277.52	1596.96	1916.16	2554.92	3832.44	5109.84
84 X 120	558.95	745.22	931.56	1117.76	1490.37	2235.59	2980.74
84 X 144	670.74	894.26	1117.87	1341.31	1788.44	2682.71	3576.89
96 X 120	663.60	876.48	1074.96	1289.84	1719.84	2554.96	3406.56
96 X 240	1327.20	1752.96	2149.92	2579.68	3439.68	5109.92	6813.12

## CLAD PLATES

For plate sizes of Stainless Clad Steel, see Industrial Products section.



# STAINLESS STEEL

## SECTION TOLERANCES STAINLESS STEEL BAR AND WIRE

Cold Finished Bar and Wire

Size Inches	Rounds C.D. or C.G.		Squares Cold Drawn	
	Plus	Minus	Plus	Minus
4 <sup>9</sup> / <sub>16</sub> TO 5.....	.008"	.008"	—	—
4 <sup>1</sup> / <sub>8</sub> TO 4 <sup>1</sup> / <sub>2</sub> .....	.005"	.005"	—	—
3 <sup>1</sup> / <sub>8</sub> TO 4.....	.003"	.003"	.003"	.003"
2 <sup>13</sup> / <sub>16</sub> TO 3.....	.003"	.003"	.003"	.003"
1 <sup>1</sup> / <sub>2</sub> TO 2 <sup>3</sup> / <sub>4</sub> .....	.003"	.003"	.003"	.003"
1 TO 1 <sup>5</sup> / <sub>32</sub> .....	.0025"	.0025"	.0025"	.0025"
<sup>5</sup> / <sub>8</sub> TO 3 <sup>1</sup> / <sub>32</sub> .....	.002"	.002"	.002"	.002"
<sup>1</sup> / <sub>2</sub> TO 1 <sup>9</sup> / <sub>32</sub> .....	.002"	.002"	.002"	.002"
<sup>3</sup> / <sub>8</sub> TO 1 <sup>1</sup> / <sub>32</sub> .....	.0015"	.0015"	.0015"	.0015"
<sup>5</sup> / <sub>16</sub> TO 1 <sup>1</sup> / <sub>32</sub> .....	.0015"	.0015"	.0015"	.0015"
.044 TO <sup>1</sup> / <sub>4</sub> .....	.001"	.001"	.001"	.001"

If required, centerless ground bars can be furnished to tolerances closer than standard.

### Cold Finished Hexagons

Size Inches	Plus	Minus
OVER 3.....	0	.010"
OVER 2 TO 3.....	0	.008"
OVER 1 TO 2.....	0	.006"
OVER <sup>1</sup> / <sub>2</sub> TO 1.....	0	.004"
<sup>1</sup> / <sub>2</sub> .....	0	.004"
<sup>5</sup> / <sub>16</sub> TO UNDER <sup>1</sup> / <sub>2</sub> .....	0	.003"
.044 TO UNDER <sup>5</sup> / <sub>16</sub> .....	0	.002"

### Hot Finished Bars

Size (in inches)	Rounds		Squares	
	Plus	Minus	Plus	Minus
OVER 4 <sup>1</sup> / <sub>2</sub> TO 5 <sup>1</sup> / <sub>2</sub> .....	.078"	0	.078"	0
OVER 3 <sup>1</sup> / <sub>2</sub> TO 4 <sup>1</sup> / <sub>2</sub> .....	.063"	0	.063"	0
OVER 2 <sup>1</sup> / <sub>2</sub> TO 3 <sup>1</sup> / <sub>2</sub> .....	.047"	0	.047"	0
OVER 2 TO 2 <sup>1</sup> / <sub>2</sub> .....	.032"	0	.032"	0
OVER 1 <sup>1</sup> / <sub>2</sub> TO 2.....	.016"	.016"	.016"	.016"
OVER 1 TO 1 <sup>1</sup> / <sub>2</sub> .....	.014"	.014"	.014"	.014"
OVER 1 <sup>1</sup> / <sub>4</sub> TO 1 <sup>3</sup> / <sub>8</sub> .....	.012"	.012"	.012"	.012"
OVER 1 <sup>1</sup> / <sub>8</sub> TO 1 <sup>1</sup> / <sub>4</sub> .....	.011"	.011"	.011"	.011"
OVER 1 TO 1 <sup>1</sup> / <sub>8</sub> .....	.010"	.010"	.010"	.010"
OVER <sup>7</sup> / <sub>8</sub> TO 1.....	.009"	.009"	.009"	.009"
OVER <sup>3</sup> / <sub>4</sub> TO <sup>7</sup> / <sub>8</sub> .....	.008"	.008"	.008"	.008"
OVER <sup>7</sup> / <sub>16</sub> TO <sup>3</sup> / <sub>8</sub> .....	.007"	.007"	.007"	.007"
OVER <sup>5</sup> / <sub>16</sub> TO <sup>7</sup> / <sub>16</sub> .....	.006"	.006"	.006"	.006"
<sup>1</sup> / <sub>4</sub> TO <sup>5</sup> / <sub>16</sub> INCL.....	.005"	.005"	.005"	.005"

Continued on next page

BAR • WIRE

TUBING • PIPE

HYDRAULIC TUBING  
STEEL

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

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# STAINLESS STEEL

## SECTION TOLERANCES STAINLESS STEEL BAR AND WIRE (Continued)

Flats and Squares

Size (in inches)	Width		Thickness		
	Over	Under	$\frac{1}{8}$ " to $\frac{1}{2}$ " Incl. Plus or Minus	Over $\frac{1}{2}$ " to 1" Incl. Plus or Minus	Over 1" to 2" Incl. Plus or Minus
OVER 4 TO 6....	.094	.063"	.015"	.020"	.031"
OVER 2 TO 4....	.063	.031"	.015"	.020"	.031"
OVER 1 TO 2....	.031	.031"	.012"	.015"	.031"
1 INCLUSIVE....	.016	.016"	.008"	.010"	....



## TYPE 303 ROUND BAR

12 Foot Random Lengths

Free Machining

Annealed

Cold Drawn—Sizes thru  
 $\frac{1}{2}$ " dia.

Centerless Ground— $\frac{1}{2}$ " thru  
4" dia.

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{16}$	.010	$\frac{23}{32}$	1.500	$\frac{17}{8}$	9.39
$\frac{3}{32}$	.023	$\frac{3}{4}$	1.50	2	10.68
$\frac{1}{8}$	.042	$\frac{13}{16}$	1.76	$2\frac{1}{8}$	12.06
$\frac{5}{32}$	.065	$\frac{7}{8}$	2.04	$2\frac{1}{4}$	13.52
$\frac{11}{64}$	.079	$\frac{15}{16}$	2.35	$2\frac{3}{8}$	15.06
$\frac{3}{16}$	.094	1	2.67	$2\frac{1}{2}$	16.69
$\frac{7}{32}$	.128	$\frac{11}{16}$	3.02	$2\frac{5}{8}$	18.40
$\frac{1}{4}$	.167	$\frac{1}{8}$	3.38	$2\frac{3}{4}$	20.20
$\frac{9}{32}$	.211	$\frac{13}{16}$	3.77	$2\frac{7}{8}$	22.07
$\frac{5}{16}$	.261	$\frac{1}{4}$	4.17	3	24.03
$\frac{11}{32}$	.316	$\frac{15}{16}$	4.60	$3\frac{1}{8}$	26.08
$\frac{3}{8}$	.376		5.05	$3\frac{1}{4}$	28.21
$\frac{13}{32}$	.441	$\frac{1}{6}$	5.52	$3\frac{1}{2}$	32.71
$\frac{7}{16}$	.511	$\frac{1}{2}$	6.01	$3\frac{3}{4}$	37.55
$\frac{15}{32}$	.660	$\frac{9}{16}$	6.52	4	42.73
$\frac{1}{2}$	.668	$\frac{15}{8}$	7.05	$4\frac{1}{2}$ *	54.07
$\frac{9}{16}$	.345	$\frac{11}{16}$	7.60	5 *	66.76
$\frac{5}{8}$	1.04	$\frac{13}{4}$	8.18	6 *	96.11
$\frac{11}{16}$	1.26				

\* Annealed and Smooth turned

# STAINLESS STEEL



## TYPE 304 ROUND BAR

### 12 Foot Random Lengths

Annealed

Cold Drawn—Sizes thru  
1/2" dia.

Centerless Ground—1/2" dia.  
and larger



Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
3/32	.023	7/8	2.04	1 15/16	10.02
1/8	.042	1	2.67	2	10.68
5/32	.065	1 1/16	3.01	2 1/8	12.06
3/16	.094	1 1/8	3.38	2 3/16	12.78
1/4	.167	1 3/16	3.77	2 1/4	13.52
5/16	.261	1 1/4	4.17	2 3/8	15.06
3/8	.376	1 5/16	4.60	2 1/2	16.69
7/16	.511	1 3/8	5.05	2 3/4	20.20
1/2	.668	1 7/16	5.52	3	24.03
9/16	.845	1 1/2	6.01	3 1/4	28.21
5/8	1.04	1 5/8	7.05	3 1/2	32.71
11/16	1.26	1 3/4	8.18	3 3/4	37.72
3/4	1.50	1 7/8	9.39	4	42.73

## TYPE 304 ROUND BAR

Forging Quality  
Ground Finish

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
1 5/16	2.347	1 1/2	6.000
1 11/16	3.500	1 5/8	7.050
1 3/16	3.770	1 7/8	9.390
1 5/16	4.600	2 1/8	22.114
1 7/16	5.520		

INDUSTRIAL PRODUCTS  
SHEET • PLATE  
ROD • SHAPES • WIRE

TUBING • PIPE

HYDRAULIC TUBING  
STEEL

MONEL-NICKEL

WEIGHTS

FOUNDRY • WELDING  
BRAZING PRODUCTS

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# STAINLESS STEEL



## TYPE 316 ROUND BAR

12 Foot Random Lengths

Annealed

Cold Drawn—Sizes thru  
1/2" dia.

Centerless Ground—1/2" thru  
4" dia.

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
1/8	.042	7/8	2.04	1 3/4	8.18
3/16	.094	1	2.67	1 7/8	9.39
1/4	.167	1 1/16	3.02	2	10.68
5/16	.261	1 1/8	3.38	2 1/4	13.52
3/8	.376	1 3/16	3.77	2 1/2	16.69
7/16	.511	1 1/4	4.17	2 3/4	20.20
1/2	.668	1 5/16	4.60	3	24.03
9/16	.845	1 3/8	5.05	3 1/8	26.08
5/8	1.04	1 1/2	6.01	3 1/4	28.21
11/16	1.26	1 9/16	6.52	4	42.73
3/4	1.50	1 5/8	7.05	4 1/4 *	48.23

\* Annealed and  
Smooth turned

## TYPE 316 ROUND BAR

Forging Quality  
Ground Finish

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
1 5/16	2.347	1 7/16	5.520
1 1/8	3.014	1 1/2	6.000
1 11/64	3.500	1 5/8	7.050
1 3/16	3.770	1 7/8	9.390

# STAINLESS STEEL

## TYPE 316 ROUND BAR AND WIRE

Rockwell 90, Annealed  
thru  $\frac{3}{8}$ " dia.—Cold Finished  
Larger than  $\frac{3}{8}$ " dia.—Center-  
less Ground

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$	.042	$\frac{3}{4}$	1.502
$\frac{3}{16}$	.094	$\frac{7}{8}$	2.044
$\frac{1}{4}$	.167	$1\frac{5}{8}$	7.051
$\frac{5}{16}$	.261	$1\frac{7}{8}$	9.388
$\frac{3}{8}$	.376	$1\frac{15}{16}$	10.020
$\frac{9}{16}$	.845	$2\frac{3}{16}$	12.780

## TYPE 321 ROUND BAR AND WIRE

Cold Finished

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{2}$	.668	$\frac{7}{8}$	2.044	$1\frac{5}{8}$	7.051
$\frac{9}{16}$	.845	1	2.670	$1\frac{3}{4}$	8.178
$\frac{5}{8}$	1.043	$1\frac{1}{8}$	3.379	$2\frac{3}{8}$	15.062
$\frac{3}{4}$	1.502	$1\frac{1}{4}$	4.173	$3\frac{1}{2}$	32.71
$1\frac{1}{16}$	1.763	$1\frac{1}{2}$	6.008		

## TYPE 347 ROUND BAR AND WIRE

Cold Finished

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{3}{8}$	.376	$1\frac{13}{16}$	1.763	$1\frac{5}{8}$	7.051
$\frac{7}{16}$	.511	$\frac{7}{8}$	2.044	$1\frac{3}{4}$	8.178
$\frac{1}{2}$	.668	$1\frac{15}{16}$	2.347	$1\frac{13}{16}$	8.773
$\frac{9}{16}$	.845	1	2.670	2	10.681
$\frac{5}{8}$	1.043	$1\frac{1}{4}$	4.173	$2\frac{1}{4}$	13.519
$1\frac{1}{16}$	1.262	$1\frac{7}{16}$	5.518	$2\frac{3}{8}$	15.062
$\frac{3}{4}$	1.502	$1\frac{1}{2}$	6.008	3	24.033

SHEET • PLATE

ROD • SHAPES • WIRE

TUBING • PIPE

HYDRAULIC TUBING  
STEEL

MONEL-NICKEL

WEIGHTS

FOUNDRY • WELDING  
BRAZING PRODUCTS

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# STAINLESS STEEL



## TYPE 416 ROUND BAR

12 Foot Random Lengths  
Free Machining, Annealed  
Cold Drawn—Sizes thru  
 $\frac{1}{2}$ " dia.  
Centerless Ground— $\frac{1}{2}$ "  
thru 4" dia.

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$	.042	1	2.67	$2\frac{1}{4}$	13.52
$\frac{3}{16}$	.094	$1\frac{1}{16}$	3.01	$2\frac{5}{16}$	14.28
$\frac{1}{4}$	.167	$1\frac{1}{8}$	3.38	$2\frac{3}{8}$	15.06
$\frac{5}{16}$	.261	$1\frac{3}{16}$	3.77	$2\frac{1}{2}$	16.69
$\frac{3}{8}$	.376	$1\frac{1}{4}$	4.17	$2\frac{5}{8}$	18.40
$\frac{7}{16}$	.511	$1\frac{3}{8}$	5.05	$2\frac{3}{4}$	20.20
$\frac{1}{2}$	.668	$1\frac{1}{2}$	6.01	3	24.03
$\frac{9}{16}$	.845	$1\frac{5}{8}$	7.05	$3\frac{1}{4}$	28.21
$\frac{5}{8}$	1.04	$1\frac{3}{4}$	8.18	$3\frac{3}{8}$	30.42
$\frac{11}{16}$	1.26	$1\frac{7}{8}$	9.39	$3\frac{1}{2}$	32.71
$\frac{3}{4}$	1.50	$1\frac{15}{16}$	10.02	$3\frac{3}{4}$	37.55
$\frac{13}{16}$	1.76	2	10.68	$4\frac{1}{4}$ *	48.23
$\frac{7}{8}$	2.04	$2\frac{1}{8}$	12.06	$4\frac{1}{2}$ *	54.07
$\frac{15}{16}$	2.35			* Annealed and Smooth turned	

## TYPE 430 AND 430F ROUND BAR

Centerless Ground  
12 Foot Random Lengths

Diameter (in inches)	Pounds per Lineal Foot
$\frac{5}{8}$	1.043

## 17-4 PH\* ROUND BAR

Annealed and Centerless  
Ground, 29 to 35 on Rockwell C  
Scale, 12 to 14 Foot Random  
lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{4}$	.167	2	10.68
$\frac{3}{8}$	.376	$2\frac{1}{16}$	11.36
$\frac{1}{2}$	.668	$2\frac{1}{8}$	12.06
$\frac{9}{16}$	.845	$2\frac{1}{4}$	13.52
$\frac{5}{8}$	1.04	$2\frac{3}{8}$	15.06
$\frac{3}{4}$	1.50	$2\frac{1}{2}$	16.69
$\frac{7}{8}$	2.04	$2\frac{5}{8}$	18.40
1	2.67	$2\frac{3}{4}$	20.20
$1\frac{1}{8}$	3.38	$2\frac{7}{8}$	22.07
$1\frac{1}{4}$	4.17	3	24.03
$1\frac{3}{8}$	5.05	$3\frac{1}{8}$	26.08
$1\frac{1}{2}$	6.01	$3\frac{1}{4}$	28.21
$1\frac{5}{8}$	7.05	$3\frac{1}{2}$	32.71
$1\frac{3}{4}$	8.18	4	42.73
$1\frac{7}{8}$	9.39		

\*17-10 P bars also available



# STAINLESS STEEL



## TYPE 303 HEXAGONAL BAR

12 Foot Random Lengths

Free Machining

Cold Drawn, Annealed,  
and Pickled

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{3}{16}$	.104	$\frac{5}{8}$	1.15	$1\frac{1}{8}$	3.73
$\frac{1}{4}$	.184	$1\frac{1}{16}$	1.39	$1\frac{1}{4}$	4.60
$\frac{5}{16}$	.288	$\frac{3}{4}$	1.66	$1\frac{5}{16}$	5.07
$\frac{11}{32}$	.348	$1\frac{3}{16}$	1.94	$1\frac{1}{2}$	6.63
$\frac{3}{8}$	.414	$\frac{7}{8}$	2.25	$1\frac{5}{8}$	7.77
$\frac{7}{16}$	.564	$1\frac{5}{16}$	2.59	$1\frac{3}{4}$	9.02
$\frac{1}{2}$	.736	1	2.94	$1\frac{13}{16}$	9.67
$\frac{9}{16}$	.932	$1\frac{1}{16}$	3.32	2	11.78

## TYPE 304 HEXAGONAL BAR

Cold Drawn, Annealed

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{2}$	.736	$1\frac{1}{16}$	3.324
$\frac{5}{8}$	1.150	$1\frac{1}{8}$	3.726
$\frac{3}{4}$	1.656	$1\frac{1}{4}$	4.601
$1\frac{1}{16}$	1.944	$1\frac{3}{8}$	5.567
$\frac{7}{8}$	2.254	$1\frac{3}{4}$	9.017

## TYPE 316 HEXAGONAL BAR

Cold Drawn, Annealed

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{2}$	.736	$1\frac{1}{16}$	3.324
$\frac{9}{16}$	.932	$1\frac{1}{8}$	3.726
$\frac{5}{8}$	1.150	$1\frac{3}{8}$	5.567
$\frac{3}{4}$	1.656	$1\frac{1}{4}$	4.601
$1\frac{1}{16}$	1.944	$1\frac{1}{2}$	6.626
$\frac{7}{8}$	2.254	$1\frac{5}{8}$	7.774
1	2.944	$1\frac{3}{4}$	9.017

TUBING • PIPE

HYDRAULIC TUBING  
STEEL

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

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# STAINLESS STEEL

## TYPE 321 HEXAGONAL BAR

Cold Finished

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{2}$	.736	$\frac{1}{8}$	3.727
$\frac{13}{16}$	1.944	$\frac{1}{4}$	4.601
$\frac{7}{8}$	2.254		

## TYPE 347 HEXAGONAL BAR

Cold Finished

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{5}{8}$	1.150	$\frac{1}{16}$	3.324
$\frac{11}{16}$	1.392	$\frac{1}{4}$	4.601
$\frac{3}{4}$	1.656	$\frac{3}{8}$	5.567
$\frac{13}{16}$	1.944	$\frac{1}{2}$	6.625
$\frac{7}{8}$	2.254		



## TYPE 416 HEXAGONAL BAR

12 Foot Random Lengths

Free Machining

Cold Drawn, Annealed,  
and Pickled

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{4}$	.184	$\frac{3}{4}$	1.66	$\frac{1}{4}$	4.60
$\frac{3}{8}$	.414	$\frac{7}{8}$	2.25	$\frac{1}{2}$	6.63
$\frac{7}{16}$	.564	1	2.94	$\frac{5}{8}$	7.78
$\frac{1}{2}$	.736	$\frac{1}{8}$	3.73	$\frac{3}{4}$	9.02
$\frac{5}{8}$	1.15				



## 17-4 PH HEXAGONAL BAR

12 Foot Random Lengths

Cold Drawn, Annealed and  
Pickled

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{3}{4}$	1.66	$\frac{7}{8}$	2.25	$\frac{1}{16}$	4.152
$\frac{5}{8}$	1.15				

# STAINLESS STEEL



## TYPE 303 SQUARE BAR

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$	.053	$\frac{7}{16}$	.651	$\frac{7}{8}$	2.60
$\frac{3}{16}$	.120	$\frac{1}{2}$	.850	1	3.40
$\frac{1}{4}$	.213	$\frac{5}{8}$	1.33	$1\frac{1}{4}$	5.31
$\frac{5}{16}$	.332	$\frac{3}{4}$	1.91	$1\frac{1}{2}$	7.65
$\frac{3}{8}$	.478	$1\frac{3}{16}$	2.25	2	13.60

## TYPE 304 AND 316 SQUARE BAR

Cold Drawn, Annealed  
and Pickled

Size (in inches)	Pounds per Lineal Foot
1	3.400
$1\frac{1}{4}$	5.313



## TYPE 416 SQUARE BAR

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{4}$	.213	$\frac{7}{16}$	.651	$\frac{3}{4}$	1.91
$\frac{5}{16}$	.332	$\frac{1}{2}$	.850	1	3.40
$\frac{3}{8}$	.478	$\frac{5}{8}$	1.33		



12 Foot Random Lengths  
Free Machining  
Cold Drawn, Annealed,  
and Pickled



12 Foot Random Lengths  
Free Machining  
Cold Drawn, Annealed,  
and Pickled

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

TUBING • PIPE

HYDRAULIC TUBING  
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FOUNDRY • WELDING  
BRAZING PRODUCTS



# STAINLESS STEEL

## TYPE 302-304 RECTANGULAR BAR

Size (in inches)	Pounds per Lineal Foot
$\frac{1}{8} \times \frac{1}{2} \dagger$	.213
$\frac{3}{8} \dagger$	.266
$\frac{3}{4}$	.319
1	.425
$1\frac{1}{4}$	.531
$1\frac{1}{2}$	.638
2	.850
3	1.275
$\frac{3}{16} \times \frac{1}{2} \dagger$	.319
$\frac{3}{4}$	.478
$\frac{7}{8}$	.558
1	.638
$1\frac{1}{4}$	.797
$1\frac{1}{2}$	.956
$1\frac{3}{4}$	1.116
2	1.28
$2\frac{1}{2}$	1.594
3	1.913
$\frac{1}{4} \times \frac{1}{2}$	.425
$\frac{5}{8}$	.531

## 12 Foot Random Lengths Hot Rolled, Annealed, and Pickled

Size (in inches)	Pounds per Lineal Foot
$\frac{1}{4} \times \frac{3}{4}$	.638
1	.850
$1\frac{1}{4}$	1.06
$1\frac{1}{2}$	1.28
2	1.70
$2\frac{1}{2}$	2.125
3	2.55
4	3.40
$\frac{3}{8} \times \frac{3}{4}$	.956
1	1.28
$1\frac{1}{4} *$	1.50
$1\frac{1}{2} *$	1.92
2	2.55
$2\frac{1}{2}$	3.188
3	3.825
4	5.100
$\frac{1}{2} \times \frac{3}{4}$	1.275
1	1.70
$1\frac{1}{4}$	2.125
$1\frac{1}{2}$	2.55

Size (in inches)	Pounds per Lineal Foot
$\frac{1}{2} \times 2$	3.40
$2\frac{1}{2}$	4.25
3	5.10
4	6.80
$\frac{5}{8} \times 1$	2.13
$1\frac{1}{2}$	3.19
$\frac{3}{4} \times 1$	2.55
$1\frac{1}{2}$	3.83
2	5.10
3	7.65
4	10.20
6	15.30
$1 \times 1\frac{1}{4}$	3.40
$1\frac{1}{2}$	5.10
2	6.80
3	10.20
4	13.60
6	20.40
10	34.00
$1\frac{1}{2} \times 1\frac{3}{4}$	8.928

\*Also stocked in Type 302 cold drawn, annealed and pickled.

†Also stocked in Type 302 cold drawn, annealed and pickled. #4 Round Edge.

## TYPE 316 RECTANGULAR BAR

Size (in inches)	Pounds per Lineal Foot
$\frac{1}{8} \times 1$	.425
$\frac{1}{4} \times \frac{1}{2}$	.425
1	.850
$1\frac{1}{2}$	1.275
$1\frac{3}{4}$	1.488

Size (in inches)	Pounds per Lineal Foot
$\frac{1}{4} \times 2$	1.700
$2\frac{1}{2}$	2.125
3	2.550
$\frac{3}{8} \times 1$	1.275
$1\frac{1}{2}$	1.913

Size (in inches)	Pounds per Lineal Foot
$\frac{3}{8} \times 2$	2.550
$2\frac{1}{2}$	3.188
3	3.825
$\frac{1}{2} \times 1$	1.700
2	3.400

# STAINLESS STEEL



## TYPE 410 RECTANGULAR BAR

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{8} \times \frac{3}{4}$	.319	$\frac{1}{2} \times \frac{3}{4}$	1.28
$\frac{1}{4} \times 1 \frac{3}{4}$	1.49	$\frac{7}{8}$	1.49
$3 \frac{1}{2}$	2.98	1	1.70

12 Foot Random Lengths  
Hot Rolled, Annealed,  
and Pickled

## SQUARE BILLETS

304 and 304 ELC  
316 and 316 ELC

Round Corners  
Forging Quality  
9 to 14 Foot Random Length

Size (in inches)	Pounds per Lineal Foot
4 x 4	54.0
6 x 6	122.0
8 x 8	217.0



## TYPE 302-304 ANGLES

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{8}$	.59	$1 \frac{1}{2} \times 1 \frac{1}{2} \times \frac{1}{4}$	2.34
$1 \times 1 \times \frac{1}{8}$	.80	$2 \times 2 \times \frac{1}{8}$	1.65
$1 \times 1 \times \frac{3}{16}$	1.16	$2 \times 2 \times \frac{3}{16}$	2.44
$1 \frac{1}{4} \times 1 \frac{1}{4} \times \frac{1}{8}$	1.01	$2 \times 2 \times \frac{1}{4}$	3.19
$1 \frac{1}{4} \times 1 \frac{1}{4} \times \frac{3}{16}$	1.48	$2 \frac{1}{2} \times 2 \frac{1}{2} \times \frac{3}{16}$	3.07
$1 \frac{1}{2} \times 1 \frac{1}{2} \times \frac{1}{8}$	1.23	$2 \frac{1}{2} \times 2 \frac{1}{2} \times \frac{1}{4}$	4.10
$1 \frac{1}{2} \times 1 \frac{1}{2} \times \frac{3}{16}$	1.80	$3 \times 3 \times \frac{1}{4}$	4.90

Hot Rolled, Annealed,  
and Pickled

20 Foot Random Lengths



## TYPE 316 ANGLES

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$1 \times 1 \times \frac{1}{8}$	.80	$1 \frac{1}{2} \times 1 \frac{1}{2} \times \frac{1}{4}$	2.34
$1 \times 1 \times \frac{3}{16}$	1.16	$2 \times 2 \times \frac{3}{16}$	2.44
$1 \frac{1}{2} \times 1 \frac{1}{2} \times \frac{1}{8}$	1.23	$2 \times 2 \times \frac{1}{4}$	3.19
$1 \frac{1}{2} \times 1 \frac{1}{2} \times \frac{3}{16}$	1.80	$3 \times 3 \times \frac{1}{4}$	4.47

Hot Rolled, Annealed,  
and Pickled  
20 Foot Random Lengths

TUBING • PIPE

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STEEL

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SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

WEIGHTS

FOUNDRY • WELDING  
BRAZING PRODUCTS

# STAINLESS STEEL

## TYPE 302 METALLIZING WIRE, ROUND\*

Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$	.041675

\*Also available in other alloys

## 17-7 PH SPRING TEMPER WIRE

Condition C

Diameter (in inches)	Pounds per Lineal Foot
$\frac{3}{16}$	.09327

## TYPE 302 AND 304 ANNEALED WIRE

Random Coils

Diameter (in inches)	Pounds per Lineal Foot
.025 *	.001667
.032 *	.002731
.040 *	.004268
.051 *	.006937
.062	.010253
.064 *	.010925
.072	.018327
.250 †	.1667

\* Stocked in 5 lb. non-  
returnable spools

† Also stocked in Type 316

## TYPE 305 SAFETY WIRE

5# spools

Diameter (in inches)	Pounds per Lineal Foot
.024	.001550
.031	.002584
.043	.004998



# STAINLESS STEEL

## TYPE 304 WIRE CLOTH

Mesh	Diameter of wire in inches	Width and Length	Pounds per Square Foot	Mesh	Diameter of wire in inches	Width and Length	Pounds per Square Foot
150	.0026	24" x 224'	.0714	12	.023	36" x 100'	.422
120	.0037	36" x 100'	.116	10	.025	36" x 100'	.412
100	.0045	36" x 100'	.142	8	.020	24" x 30'	.186
		29" x 25'	.142		.028	36" x 100'	.411
60	.0075	36" x 100'	.237		.032	29" x 25'	.541
50	.009	36" x 100'	.32		.035	36" x 100'	.651
		42" x 100'	.32	4	.047	36" x 100'	.572
30	.011	36" x 100'	.245		.063	48" x 100'	1.048
40	.013	24" x 100'	.488	3	.027	36" x 100'	.428
20	.016	36" x 100'	.344	2	.063	36" x 100'	.512
		29" x 25'	.344		.080	36" x 100'	.83
16	.020	36" x 100'	.43			48" x 100'	.83
	.018	36" x 100'	.345				

## TYPE 304 MECHANICAL NEEDLE TUBING

Cold Drawn and Annealed

O.D. (in inches)	I.D. (in inches)	Wall Thickness (in inches)	Pounds per Lineal Foot
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.065

.047

.009

.52

TUBING • PIPE

HYDRAULIC TUBING  
STEEL

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ROD • SHAPES • WIRE

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

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# STAINLESS STEEL

## TYPE 304 TUBING — SEAMLESS

Cold Drawn, Annealed,  
and Pickled  
20 Foot Random Lengths

O.D. (in inches)	I.D. (in inches)	Wall Thickness (in inches)	Pounds per Lineal Foot
$\frac{3}{16}$	.143	.022	.037
	.123	.032	.055
	.117	.035	.057
$\frac{1}{4}$	.194	.028	.066
	.180	.035	.080
	.152	.049	.105
$\frac{5}{16}$	.120 *	.065	.128
	.257	.028	.085
	.243	.035	.104
$\frac{3}{8}$	.215	.049	.138
	.182	.065	.172
	.305	.035	.127
$\frac{1}{2}$	.277	.049	.171
	.245 *	.065	.215
	.430 *	.035	.174
$\frac{5}{8}$	.402 *	.049	.236
	.370 *	.065	.302
	.555	.035	.220
$\frac{3}{4}$	.527	.049	.301
	.495	.065	.389
	.680	.035	.267
$\frac{7}{8}$	.652	.049	.367
	.620	.065	.475
	.745	.065	.562
1	.870	.065	.649
	.834	.083	.813
	1.232	.134	1.96
$1\frac{1}{4}$	1.652	.049	.890
	1.620	.065	1.17
	1.870	.065	1.34

\*Also stocked in Type 316

# STAINLESS STEEL

## TYPE 304 TUBING — WELDED

Full Finish, Annealed,  
and Pickled  
20 Foot Random Lengths

O.D. (in inches)	I.D. (in inches)	Wall Thickness (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$	.055	.035	.034
$\frac{3}{16}$	.118	.035	.057
$\frac{1}{4}$	.180 *	.035	.080
	.170	.040	.090
	.152	.049	.105
	.120 *	.065	.128
$\frac{5}{16}$	.243	.035	.104
	.215	.049	.138
	.183	.065	.172
$\frac{3}{8}$	.305 *	.035	.127
	.277 *	.049	.171
	.245	.065	.215
$\frac{7}{16}$	.367	.035	.151
	.340	.049	.204
$\frac{1}{2}$	.430 *	.035	.174
	.402 *	.049	.236
	.370 *	.065	.302
$\frac{9}{16}$	.493	.035	.197
$\frac{5}{8}$	.555	.035	.220
	.527 *	.049	.301
	.495	.065	.389
$\frac{3}{4}$	.680	.035	.267
	.652 *	.049	.367
	.620 *	.065	.475
	.584	.083	.591
$\frac{7}{8}$	.805	.035	.314
	.777	.049	.432
1	.930	.035	.361
	.902	.049	.498
	.870 *	.065	.649
	.834	.083	.813
	.760	.120	1.288
$1\frac{1}{8}$	.760	.035	.407
	1.055 †	.065	.736

\* Stocked also in TYPE 316

† Stocked also in TYPE 304  
with #4 polish on O.D.

Continued on next page

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

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STEEL

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FOUNDRY • WELDING  
BRAZING PRODUCTS



# STAINLESS STEEL

## TYPE 304 TUBING — WELDED (Continued)

Full Finish, Annealed,  
and Pickled

20 Foot Random Lengths

O.D. (in inches)	I.D. (in inches)	Wall Thickness (in inches)	Pounds per Lineal Foot
1 $\frac{1}{4}$	1.180 †	.035	.454
	1.152	.049	.628
	1.120 *	.065	.823
	1.010	.120	1.448
1 $\frac{3}{8}$	1.245	.065	.909
	1.430	.035	.548
	1.402	.049	.759
	1.370 *	.065	.996
1 $\frac{1}{2}$	1.334	.083	1.26
	1.260	.120	1.77
	1.495	.065	1.08
	1.680	.035	.641
1 $\frac{5}{8}$	1.652	.049	.890
	1.620	.065	1.17
	1.745	.065	1.26
	1.930	.035	.734
2	1.902	.049	1.02
	1.870 * †	.065	1.34
	1.834	.083	1.70
	1.760	.120	2.41
2 $\frac{1}{4}$	1.625	.188	3.64
	2.152	.049	1.15
	2.120	.065	1.52
	2.370	.065	1.69
2 $\frac{1}{2}$	2.260	.120	3.05
	2.870	.065	2.04
	2.834	.083	2.59
	2.760	.120	3.69
3	3.187	.031	1.07
	3.834 *	.083	3.47
	4.176	.037	1.67
	6.162	.044	2.92
3 $\frac{1}{4}$	8.162	.044	3.86

\* Stocked also in TYPE 316

† Stocked also in TYPE 304  
with #4 polish on O.D.

# STAINLESS STEEL

## TYPE 304 BEVERAGE TUBING

O.D. (in inches)	I.D. (in inches)	Wall Thickness (in inches)	Pounds per Lineal Foot
$\frac{1}{4}$	.210	.020	.049
$\frac{5}{16}$	.272	.020	.063
$\frac{3}{8}$	.335	.020	.093

## TYPE 321 TUBING—WELDED

Full Finished, Annealed  
and Pickled  
20 Foot Random Lengths

O.D. (in inches)	I.D. (in inches)	Wall Thickness (in inches)	Pounds per Lineal Foot
$\frac{3}{16}$	.117 *	.035	.034
$\frac{1}{4}$	.210	.020	.049
	.194	.028	.066
	.180 *	.035	.080
$\frac{5}{16}$	.208	.020	.063
	.242 *	.035	.104
$\frac{3}{8}$	.335	.020	.093
	.305 *	.035	.127
$\frac{7}{16}$	.367 †	.035	.151
$\frac{1}{2}$	.460	.020	.103
	.444	.028	.141
	.430 *	.035	.174
$\frac{5}{8}$	.555 †	.035	.220
$\frac{3}{4}$	.680 *	.035	.267
1	.944	.028	.291
	.930 *	.035	.361
$1\frac{1}{4}$	1.180 †	.035	.454

\* Also stocked in Seamless, Cold Drawn,  
Annealed and Pickled

† Stocked in Seamless only.

SHEET • PLATE

ROD • SHAPES • WIRE

MONEL-NICKEL

HYDRAULIC TUBING  
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BRAZING PRODUCTS

# STAINLESS STEEL

## TYPE 347 TUBING—WELDED

Full Finished, Annealed  
and Pickled  
20 Foot Random Lengths

O.D. (in inches)	I.D. (in inches)	Wall Thickness (in inches)	Pounds per Lineal Foot
$\frac{1}{4}$	.210	.020	.049
$\frac{5}{16}$	.242	.035	.104
$\frac{3}{8}$	.335	.020	.093
	.319	.028	.104
$\frac{1}{2}$	.430	.035	.174
$\frac{3}{4}$	.694	.028	.216
	.680	.035	.267

## TYPE 446 TUBING—SEAMLESS

Cold Drawn, Annealed  
and Pickled  
20 Foot Random Lengths

O.D. (in inches)	I.D. (in inches)	Wall Thickness (in inches)	Pounds per Lineal Foot
$\frac{5}{16}$	.188	.063	.168

## PRESSURE TUBING

Welded and seamless pressure tubing in all standard grades of Stainless Steel, for use in condenser, heat exchanger, boiler, and still tube applications, are available at mill prices and mill delivery. This tubing is produced to meet ASTM specifications, or other applicable industry specifications.

For additional information, call your nearest warehouse sales office.



# STAINLESS STEEL

## SEAMLESS PIPE

TYPES 304 and 304L  
TYPES 316 and 316L

### Schedule 10

Cold Drawn, Annealed  
and Pickled

20 Foot Random Lengths

IPS (in inches)	O.D. (in inches)	I.D. (in inches)	Wall Thickness (in inches)	Pounds per Lineal Foot
1/8	.405	.307	.049	.1863
1/4	.540	.410	.065	.3297
3/8	.675	.545	.065	.4235
1/2	.840	.674	.083	.6710
3/4	1.050	.884	.083	.857
1	1.315	1.097	.109	1.404
1 1/4	1.660	1.442	.109	1.806
1 1/2	1.90	1.682	.109	2.085
2	2.375	2.157	.109	2.638
2 1/2	2.875	2.635	.120	3.531
3	3.500	3.26	.120	4.332
3 1/2	4.00	3.76	.120	4.973
4	4.50	4.26	.120	5.613

## SEAMLESS PIPE

TYPES 304 and 304L  
TYPES 316 and 316L

### Standard Weight, Schedule 40

Cold Drawn, Annealed,  
and Pickled

20 Foot Random Lengths

IPS (in inches)	O.D. (in inches)	I.D. (in inches)	Wall Thickness (in inches)	Pounds per Lineal Foot
1/8	.405	.269	.068	.245
1/4	.540	.364	.088	.425
3/8	.675	.493	.091	.568
1/2	.840	.622	.109	.851
3/4	1.05	.824	.113	1.13
1	1.315	1.049	.133	1.68
1 1/4	1.66	1.38	.140	2.27
1 1/2	1.90	1.61	.145	2.72
2	2.375	2.067	.154	3.65
2 1/2	2.875	2.469	.203	5.79
3	3.50	3.068	.216	7.58
3 1/2	4.00	3.548	.226	9.11
4	4.50	4.026	.237	10.79
5	5.563	5.047	.258	14.62
6	6.625	6.065	.280	18.97
8	8.625	7.981	.322	28.55

HYDRAULIC TUBING  
STEEL

SHEET • PLATE

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MONEL-NICKEL

WEIGHTS

FOUNDRY • WELDING  
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# STAINLESS STEEL

## SEAMLESS PIPE TYPES 304 and 304L TYPES 316 and 316L

Extra Heavy, Schedule 80

Cold Drawn, Annealed,  
and Pickled

20 Foot Random Lengths

IPS (in inches)	O.D. (in inches)	I.D. (in inches)	Wall Thickness (in inches)	Pounds per Lineal Foot
$\frac{1}{4}$	.540	.302	.119	.535
$\frac{3}{8}$	.675	.423	.126	.739
$\frac{1}{2}$	.840	.546	.147	1.09
$\frac{3}{4}$	1.05	.742	.154	1.47
1	1.315	.957	.179	2.17
$1\frac{1}{4}$	1.66	1.278	.191	3.00
$1\frac{1}{2}$	1.90	1.50	.200	3.63
2	2.375	1.939	.218	5.02
$2\frac{1}{2}$	2.875	2.323	.276	7.66
3	3.50	2.90	.300	10.25
$3\frac{1}{2}$	4.00	3.364	.318	12.51
4	4.50	3.826	.337	14.98

## WELDED PIPE TYPES 304 and 304L TYPES 316 and 316L

Schedule 5

Annealed and Pickled  
20 foot Random Lengths

IPS (in inches)	O.D. (in inches)	I.D. (in inches)	Wall Thickness (in inches)	Pounds per Lineal Foot
$\frac{1}{2}$	.840	.710	.065	.538
$\frac{3}{4}$	1.050	.920	.065	.683
1	1.315	1.185	.065	.867
$1\frac{1}{4}$	1.660	1.530	.065	1.107
$1\frac{1}{2}$	1.900	1.770	.065	1.274
2	2.375	2.245	.065	1.604
$2\frac{1}{2}$	2.875	2.709	.083	2.475
3	3.500	3.334	.083	3.029
$3\frac{1}{2}$	4.000	3.834	.083	3.472
4	4.500	4.334	.083	3.195
5	5.563	5.345	.109	6.349
6	6.625	6.407	.109	7.585
8	8.625	8.407	.109	9.914
10	10.750	10.482	.134	15.190
12	12.750	12.438	.156	20.980

# STAINLESS STEEL

## WELDED PIPE TYPES 304 and 304L TYPES 316 and 316L

### Schedule 10 Annealed and Pickled 20 Foot Random Lengths

IPS (in inches)	O.D. (in inches)	I.D. (in inches)	Wall Thickness (in inches)	Pounds per Lineal Foot
1/8	.405	.307	.049	.1863
1/4	.540	.410	.065	.3297
3/8	.675	.545	.065	.4235
1/2	.840	.674	.083	.6710
3/4	1.050	.884	.083	.8572
1	1.315	1.097	.109	1.404
1 1/4	1.660	1.442	.109	1.806
1 1/2	1.900	1.682	.109	2.085
2	2.375	2.157	.109	2.638
2 1/2	2.875	2.635	.120	3.531
3	3.500	3.260	.120	4.332
3 1/2	4.000	3.760	.120	4.973
4	4.500	4.260	.120	5.613
5	5.563	5.295	.134	7.769
6	6.625	6.357	.134	9.289
8	8.625	8.329	.148	13.40
10	10.750	10.420	.165	18.65
12	12.750	12.390	.180	24.17

## WELDED PIPE TYPES 304 and 304L TYPES 316 and 316L

### Schedule 40 Annealed and Pickled 20 Foot Random Lengths

IPS (in inches)	O.D. (in inches)	I.D. (in inches)	Wall Thickness (in inches)	Pounds per Lineal Foot
1/8	.405	.269	.068	.2447
1/4	.540	.364	.088	.4248
3/8	.675	.493	.091	.5676
1/2	.840	.622	.109	.8510
3/4	1.050	.824	.113	1.131
1	1.315	1.049	.133	1.679
1 1/4	1.660	1.380	.140	2.273
1 1/2	1.900	1.610	.145	2.718
2	2.375	2.067	.154	3.653
2 1/2	2.875	2.469	.203	5.793
3	3.500	3.068	.216	7.576
3 1/2	4.000	3.548	.226	9.109
4	4.500	4.026	.237	10.79
5	5.563	5.047	.258	14.62
6	6.625	6.065	.280	18.97
8	8.625	7.981	.322	28.55
10	10.750	10.020	.365	40.48
12	12.750	12.000	.375	49.56

HYDRAULIC TUBING  
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# STAINLESS STEEL

## WELDED PIPE TYPES 304 and 304L TYPES 316 and 316L

Schedule 80  
Annealed and Pickled  
20 Foot Random Lengths

IPS (in inches)	O.D. (in inches)	I.D. (in inches)	Wall Thickness (in inches)	Pounds per Lineal Foot
2½	2.875	2.323	.276	7.66
3	3.500	2.900	.300	10.25
3½	4.000	3.364	.318	12.50
4	4.500	3.826	.337	14.98
5	5.563	4.813	.375	20.78
6	6.625	5.761	.432	28.57
8	8.625	7.625	.500	43.39
10	10.750	9.750	.500	54.74
12	12.750	11.750	.500	65.42

## TYPICAL LADLE ANALYSIS — WELDED STAINLESS TUBING AND PIPE

Analyses Chart (Per Cent)

Type No.	Carbon (*)	Chromium	Nickel	Other Elements
302	.15	17-19	8-10	
304	.08	18-20	8-12	
304L	.03	18-20	8-12	
305	.12	17-19	10-13	
309	.20	22-24	12-15	
309S	.08	22-24	12-15	
309SCB	.08	22-24	12-15	CB 10 X C MINIMUM 1 MAXIMUM
310	.25	24-26	19-22	
310S	.08	24-26	19-22	
316	.08	16-18	10-14	MO 2-3
316L	.03	16-18	10-14	MO 2-3
317	.08	18-20	11-15	MO 3-4
321	.08	17-19	9-12	TI 5 X C MINIMUM
321H	.04-.10	17-19	9-12	TI 5 X C MINIMUM
329	.20	23-28	2½- 5	MO 1-2
330	.15	14-16	33-36	
347	.08	17-19	9-13	CB-TA 10 X C MINIMUM
348	.08	17-19	9-13	CB-TA 10 X C MINIMUM TA .10 MAXIMUM
430	.12	14-18		
442	.20	18-23		
443	.20	18-23		CU .9-1.25

(\*) Maximum — unless otherwise indicated.

Note: Practically all welded stainless tubing specifications carry silicon, manganese, sulphur, and phosphorus requirements in addition to the elements shown. Consult the individual specification for specific requirements.

# STAINLESS STEEL

## TYPICAL MECHANICAL PROPERTIES — ANNEALED WELDED STAINLESS TUBING AND PIPE

Type No.	Tensile Strength (psi)	Yield Strength (psi)	Elongation 2" (%)	Rockwell Hardness "B"
302	85,000	35,000	50	85
304	85,000	35,000	50	80
304L	80,000	30,000	55	75
305	90,000	45,000	55	80
309	95,000	40,000	45	85
309S	95,000	40,000	45	85
309SCB	90,000	40,000	45	85
310	95,000	40,000	45	90
310S	95,000	40,000	45	90
316	85,000	35,000	50	85
316L	80,000	30,000	50	75
317	85,000	35,000	50	85
321	85,000	35,000	50	80
321H	85,000	35,000	50	80
329	105,000	80,000	25	100
330	95,000	60,000	25	90
347	85,000	35,000	45	85
348	85,000	35,000	45	85
430	75,000	40,000	25	80
442	80,000	40,000	25	85
443	85,000	45,000	20	85

Note: It should be noted that tubing .625" and under has lesser percent elongation than shown in the table.

## SEAMLESS HYDRAULIC STEEL TUBING

### Cold Drawn

AISI 1010, Dead Soft,  
Bright Finish, Annealed

Pressure Tested to 1000 P.S.I.  
JIC Specification

17 to 24 Foot Random Lengths

O.D. (in inches)	Wall Thickness		Nominal I.D.	Pounds per Lineal Foot
	B.W.G.	Dec. Inch		
1/8	22	.028	.069	.0290
3/16	22*	.028	.131	.0478
	20	.035	.117	.0572
1/4	20*	.035	.180	.0804
	18*	.049	.152	.1052
	16	.065	.120	.1284
5/16	20	.035	.242	.1039
	18	.049	.214	.1382
	16	.065	.182	.1722

Continued on next page

\* Stock also in cold drawn, electric welded.

SHEET • PLATE

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MONEL-NICKEL

HYDRAULIC TUBING  
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# STAINLESS STEEL

## SEAMLESS HYDRAULIC STEEL TUBING

(Continued)

Cold Drawn

AISI 1010, Dead Soft,  
Bright Finish, Annealed

Pressure Tested to 1000 P.S.I.  
JIC Specification

17 to 24 Foot Random Lengths

O.D. (in inches)	Wall Thickness		Nominal I.D.	Pounds per Lineal Foot
	B.W.G.	Dec. Inch		
$\frac{3}{8}$	20*	.035	.305	.1271
	18*	.049	.277	.1706
	17	.058	.259	.1964
	16*	.065	.245	.2152
$\frac{1}{2}$	20*	.035	.430	.1738
	18*	.049	.402	.2360
	16*	.065	.370	.3020
	15	.072	.356	.3291
	14	.083	.334	.3696
	11	.120	.260	.4870
$\frac{5}{8}$	20*	.035	.555	.2205
	18*	.049	.527	.3014
	16*	.065	.495	.3888
	14*	.083	.459	.4805
$\frac{3}{4}$	18*	.049	.652	.3668
	16*	.065	.620	.4755
	14	.083	.584	.5913
	13	.095	.560	.6646
$\frac{7}{8}$	16*	.065	.745	.5623
1	18	.049	.902	.4977
	16*	.065	.870	.6491
	14	.083	.834	.8129
	13	.095	.810	.9182
$1\frac{1}{4}$	12	.109	.782	1.037
	11	.120	1.010	1.448

\* Stocked also in cold drawn electric welded.





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TO KNOW ABOUT THE**

## **NICKEL ALLOYS**

The International Nickel Company has prepared an unusually complete library of books and technical bulletins on nickel and nickel alloys. All of these are yours for the asking. Some of them are listed on the next page.

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**SEAMLESS  
STEEL TUBING**  
(Continue)

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\* Stocked

Stocks change from time to time. If the material you want is not listed here, call or write the warehouse sales office nearest you for additional information.

# MONEL NICKEL

## LITERATURE ON THE INCO ALLOYS

The International Nickel Company publishes hundreds of booklets and pamphlets on nickel and nickel alloys. All are available to you, free. Just a few of these are listed below. Call or write our warehouse sales office nearest you and ask for the literature you need.

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**MONEL - NICKEL**

Weight per Square Foot for  
Monel\* Plate, Sheet and Strip

U.S.S. Gauge	Thickness (in inches)	Weight per Square Foot	U.S.S. Gauge	Thickness (in inches)	Weight per Square Foot
—	.500	22.97	14	.078	3.58
—	.375	17.23	15	.070	3.22
3	.250	11.48	16	.062	2.85
4	.234	10.7	17	.056	2.57
5	.218	10.0	18	.050	2.30
6	.203	9.33	19	.043	1.98
7	.187	8.59	20	.037	1.70
8	.171	7.86	21	.034	1.56
9	.156	7.17	22	.031	1.42
10	.140	6.43	23	.028	1.29
11	.125	5.74	24	.025	1.15
12	.109	5.01	25	.021	.965
13	.093	4.27	26	.018	.827

\*The table shown above is for Monel. To obtain approximate theoretical weight for a desired alloy, multiply the Monel weight shown in this table by the conversion factor listed below.

Alloy		Conversion Factor
New Designation	Old Designation	
<b>MONEL alloy 400</b>	MONEL	1.00
<b>MONEL alloy R-405</b>	"R" MONEL	1.00
<b>MONEL alloy 403</b>	MONEL "403"	1.003
<b>MONEL alloy K-500</b>	"K" MONEL	.956
<b>MONEL alloy 501</b>	"KR" MONEL	.956
<b>NICKEL 200</b>	"A" NICKEL	1.006
<b>DURANICKEL alloy 301</b>	DURANICKEL	.934
<b>INCONEL alloy 600</b>	INCONEL	.953
<b>INCONEL alloy X-750</b>	INCONEL "X"	.934
<b>INCOLOY alloy 800</b>	INCOLOY	.909
<b>NI-O-NEL alloy 825</b>	NI-O-NEL	.922



# MONEL-NICKEL

## MONEL SHEET

New Designation:  
**MONEL alloy 400**

Hot Rolled, Annealed,  
and Pickled

SEAMLESS  
STEEL TUBES  
(Continue)

MONEL-NICKEL

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet	Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
.250	3	36 X 96	276.0	.062	16	36 X 96	68.4
		36 X 120	345.0			36 X 120	85.5
		48 X 120	460.0			48 X 96	91.2
.187	7	36 X 96	206.16			48 X 120	114.0
		36 X 120	257.7	.050	18	30 X 96	46.0
		48 X 120	343.6			36 X 96	55.2
.156	9	36 X 120	215.1			36 X 120	69.0
		48 X 120	286.8			48 X 96	73.6
.140	10	36 X 96	154.3			48 X 120	92.0
		36 X 120	192.9	.037	20	36 X 72	30.2
		48 X 96	205.8			36 X 96	40.8
		48 X 120	257.2			36 X 120	51.0
.125	11	36 X 96	137.8			48 X 84	47.6
		36 X 120	172.2			48 X 96	54.4
		48 X 120	229.6			48 X 120	68.0
.109	12	36 X 96	120.2	.031	22	36 X 96	34.1
		36 X 120	150.3			36 X 120	42.6
		48 X 96	160.3			48 X 96	45.4
		48 X 120	200.4			48 X 120	56.8
.093	13	36 X 96	102.48	.025	24	24 X 96	18.4
		36 X 120	128.1			36 X 96	27.6
		48 X 120	170.8			36 X 120	34.5
.078	14	30 X 96	71.6	.021	25	24 X 96	15.44
		30 X 120	89.5			30 X 120	24.13
		36 X 96	85.92			36 X 96	23.16
		36 X 120	107.4	.018	26	36 X 96	19.85
		42 X 120	125.3				
		48 X 96	114.6				
		48 X 120	143.2				

\* Stocked

# MONEL-NICKEL

## MONEL ROOFING SHEET

New Designation:

**MONEL alloy 400**

**Hot Rolled, Annealed and Pickled**

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
.031	22	24 X 96	22.78
		30 X 96	28.48
		36 X 96	34.18
.025	24	24 X 96	18.37
		30 X 96	22.96
		36 X 96	27.6
		36 X 120	34.5

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
.021	25	24 X 96	15.44
		30 X 96	19.30
		36 X 96	23.16
.018	26	36 X 120	28.95
		24 X 96	13.23
		30 X 96	16.54
		36 X 96	19.85

## MONEL SHEET

New Designation:

**MONEL alloy 400**

**Cold Rolled, Annealed**

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
.250	3	36 X 72	206.64
		36 X 96	276.0
		36 X 120	345.0
		48 X 120	460.0
.187	7	36 X 72	154.62
		36 X 96	206.2
		36 X 120	257.7
		48 X 96	274.88
		48 X 120	343.6
.156	9	36 X 96	171.98
		48 X 120	286.64
		48 X 120	286.64
.140	10	36 X 96	154.3
		36 X 120	192.9
		48 X 120	257.24
.125	11	24 X 96	91.81
		30 X 96	114.84
		36 X 96	137.8

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
.125	11	36 X 120	172.2
		48 X 96	183.74
		48 X 120	229.6
		48 X 144	257.62
.109	12	30 X 96	100.14
		36 X 96	120.24
		36 X 120	150.30
		48 X 96	160.32
		48 X 120	200.4
.093	13	48 X 144	240.34
		30 X 96	85.44
		36 X 96	102.48
		48 X 120	170.80
.078	14	48 X 144	205.05
		30 X 96	71.66
		36 X 96	85.92
		36 X 120	107.40

Continued on next page

# MONEL-NICKEL

## MONEL SHEET

New Designation:  
**MONEL alloy 400**

(Continued)

Cold Rolled, Annealed

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
.078	14	42 X 120	125.30
		48 X 120	143.2
		48 X 144	171.98
		48 X 188	224.4
.062	16	30 X 96	56.96
		36 X 96	68.40
		36 X 120	85.5
		48 X 120	114.0
.050	18	48 X 144	136.70
		30 X 96	45.94
		30 X 120	57.43
		36 X 96	55.20
		36 X 120	69.0
		42 X 120	80.50
		48 X 120	91.88
		48 X 144	110.26
.043	19	30 X 96	39.50
		36 X 96	47.30
		48 X 120	79.00
.037	20	24 X 96	27.20
		30 X 72	25.50
		30 X 96	34.00

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
.037	20	36 X 96	40.80
		36 X 120	51.00
		48 X 120	68.00
		48 X 144	81.60
.031	22	24 X 96	22.78
		30 X 96	28.48
		36 X 96	34.08
		36 X 120	42.6
		48 X 96	45.57
		48 X 120	56.96
.025	24	24 X 96	18.37
		30 X 96	22.96
		36 X 96	27.6
		36 X 120	34.44
		42 X 120	40.18
.021	25	24 X 96	15.44
		30 X 96	19.3
		36 X 96	23.16
		36 X 120	28.95
.018	26	36 X 96	19.85
		36 X 120	24.81

## BILLING WEIGHTS INCO ALLOY PLATES

Hot Rolled — thru 96" widths.  
Monel alloy 400 used as basic  
weight. See conversion  
factors for other Inco alloys.

Decimal Thickness	Thickness (Inches)	Pounds Per Square Foot
.1875	$\frac{3}{16}$	9.216
.2500	$\frac{1}{4}$	12.173
.3125	$\frac{5}{16}$	15.216
.3750	$\frac{3}{8}$	18.087

Decimal Thickness	Thickness (Inches)	Pounds Per Square Foot
.4375	$\frac{7}{16}$	21.102
.5000	$\frac{1}{2}$	23.887
.5625	$\frac{9}{16}$	26.873
.6250	$\frac{5}{8}$	29.858

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SEAMLESS  
STEEL TUBES  
(Continued)

MONEL-NICKEL

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$\frac{7}{8}$

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$1\frac{1}{4}$

\* Stock



# MONEL-NICKEL

## BILLING WEIGHTS (Con't.)

### INCO ALLOY PLATES

Hot Rolled — thru 96" widths

Decimal Thickness	Thickness (Inches)	Pounds Per Square Foot	Decimal Thickness	Thickness (Inches)	Pounds Per Square Foot
.6875	$\frac{11}{16}$	32.844	2.000	2	93.709
.7500	$\frac{3}{4}$	35.830	2.125	$2\frac{1}{8}$	99.566
.8125	$\frac{13}{16}$	38.816	2.250	$2\frac{1}{4}$	105.423
.8750	$\frac{7}{8}$	41.802	2.375	$2\frac{3}{8}$	111.280
.9375	$\frac{15}{16}$	44.788	2.500	$2\frac{1}{2}$	117.137
1.0000	1	47.314	2.625	$2\frac{5}{8}$	122.994
1.1250	$1\frac{1}{8}$	53.228	2.750	$2\frac{3}{4}$	128.851
1.2500	$1\frac{1}{4}$	59.143	2.875	$2\frac{7}{8}$	134.707
1.3750	$1\frac{3}{8}$	65.057	3.000	3	140.564
1.500	$1\frac{1}{2}$	70.971	3.250	$3\frac{1}{4}$	152.278
1.625	$1\frac{5}{8}$	76.885	3.500	$3\frac{1}{2}$	163.992
1.750	$1\frac{3}{4}$	82.800	3.750	$3\frac{3}{4}$	175.705
1.875	$1\frac{7}{8}$	88.714	4.000	4	187.419

## CONVERSION FACTORS

Inco Alloy Plates — Hot Rolled

Alloy	Conversion Factor	Alloy	Conversion Factor
NICKEL 200	1.006	MONEL ALLOY 404	1.003
NICKEL 201	1.006	MONEL ALLOY K-500	0.956
NICKEL 205	1.006	INCONEL ALLOY 600	0.953
NICKEL 233	1.006	INCOLOY ALLOY 800	0.909
MONEL ALLOY 400	1.000	INCOLOY ALLOY 801	0.900
MONEL ALLOY 402	1.000	INCOLOY ALLOY 804	0.897
MONEL ALLOY 403	1.003	NI-O-NEL ALLOY 825	0.922

Billing weights for plate widths over 96" are invoiced at the actual shipping weight.

For thicknesses other than those shown, data will be furnished upon inquiry.

When calculating square footage, use three figures beyond decimal. Adjust billing weights to nearest full pounds.

EXAMPLE: Inconel Alloy 600 plate  
15 pcs. - 1.750" × 37.500" × 96.750

$$\frac{37.500 \times 96.750}{\text{width} \quad \text{length}} \div 144 = \frac{25.195 \times 82.800}{\text{sq. ft.} \quad \text{lbs./sq. ft.}} \times 15 \text{ Pcs} \times \frac{.953}{\text{conversion factor}} = \frac{29821}{\text{lbs. billing weight}}$$

# MONEL-NICKEL

## MONEL PLATE

New Designation:  
**MONEL alloy 400**

**Hot Rolled**

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Plate	Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Plate
.187	7	48 X 120	368.6	.500	7/0	48 X 144	1146.6
		72 X 180	829.4			60 X 120	1194.4
.250	3	36 X 96	292.2			72 X 180	2149.8
		72 X 180	1095.6	.750		48 X 120	1433.2
.375	3/0	36 X 96	434.1			48 X 144	1719.8
		36 X 120	542.6	1.000		48 X 48	757.0
		48 X 120 *	723.5			48 X 96	1514.0
		48 X 144	868.2			48 X 120	1892.6
		72 X 180	1627.8	1.250		48 X 48	946.3
.500	7/0	36 X 120	716.6			48 X 96	1892.6
		48 X 120 *	955.5				

\* Annealed & Descaled

## MONEL BANDING STRIP

New Designation:  
**MONEL alloy 400**

**Cold Rolled in Coils**

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
.015 X 1/2	.0302	.020 X 1/2	.0382	.020 X 1 1/8	.0860
.015 X 3/4	.0454	.020 X 3/4	.0574	.020 X 6	.4590

## MONEL STRAPPING SEALS

New Designation:  
**MONEL alloy 400**

Monel Strapping seals are available in the following sizes: 1/2 X 1 1/16 (#12), 3/4 X 1 1/8

\* Stocked

# MONEL-NICKEL

## "A" NICKEL SHEET

New Designation:  
NICKEL 200

Cold Rolled, Annealed

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet	Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
.187	7	36 X 96	207.4	.050	18	36 X 96	55.4
		48 X 120	345.6			36 X 120	69.3
.140	10	36 X 120	194.1			48 X 120	92.4
.125	11	36 X 96	138.7	.037	20	36 X 96	44.0
		48 X 120	231.2			48 X 120	68.4
.093	13	36 X 96	103.1	.031	22	36 X 96	34.4
		48 X 120	172.0			36 X 120	42.9
.078	14	36 X 96	86.5	.025	24	36 X 96	27.7
		48 X 120	144.4			48 X 96	36.9
.062	16	36 X 96	68.9	.021	25	36 X 96	23.3
		36 X 120	86.1	.018	26	36 X 96	19.9
		48 X 120	114.8				

## "A" NICKEL SHEET

New Designation:  
NICKEL 200

Hot Rolled, Annealed,  
and Pickled

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet	Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
.250	3	36 X 120	348.0	.125	11	36 X 120	173.4
		48 X 120	464.4			48 X 120	231.2
.187	7	36 X 96	207.4	.109	12	48 X 120	201.6
		48 X 120	345.6	.078	14	48 X 120	144.4
.140	10	36 X 120	194.1	.062	16	36 X 120	86.1
		48 X 120	258.8			48 X 120	114.8

INDUSTRIAL PRODUCTS

ROD • SHAPES • WIRE

TUBING • PIPE

WEIGHTS

FOUNDRY • WELDING  
BRAZING PRODUCTS

DATA



# MONEL-NICKEL

## "A" NICKEL PLATE

New Designation:

**NICKEL 200**

Hot Rolled

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Plate	Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Plate
.187	7	72 X 180	834	.500	7/0	72 X 180	2163
.250	3	60 X 144	735	.750		48 X 120	1442
		72 X 180	1102			48 X 144	1730
.313	1/0	48 X 144	735	1.000		48 X 48	762
.375	3/0	48 X 144	873			48 X 96	1524
		60 X 144	1092			48 X 120	1904
		72 X 180	1638	1.250		48 X 48	952
.500	7/0	48 X 144	1153			48 X 96	1904
		60 X 120	1202				

## INCONEL SHEET

New Designation:

**INCONEL alloy 600**

Cold Rolled, Annealed

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet	Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
.250	3	48 X 120	464.0	.050	18	36 X 96	52.5
.125	11	36 X 96	131.3	.043	19	36 X 96	45.2
		48 X 120	221.2	.037	20	36 X 96	38.9
.093	13	36 X 96	97.7	.031	22	36 X 96	32.6
		48 X 120	164.4	.025	24	36 X 96	26.3
.078	14	36 X 96	81.9	.021	25	36 X 96	22.1
.062	16	36 X 96	65.1	.018	26	36 X 96	18.9
		48 X 120	109.6				

SEAMLESS  
STEEL TUB

(Continued)

MONEL-NICKEL

3/4

7/8

1

1 1/4

\* Stock

# MONEL-NICKEL

## INCONEL SHEET AND PLATE

New Designation:

**INCONEL alloy 600**

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
1.000		48 X 96	1443
		48 X 120	1804
.750		48 X 120	1366
		48 X 144	1639
.625		48 X 120	1138
		48 X 144	1366
		60 X 120	1423
.500	7/0	48 X 120	911
		48 X 144	1093
		60 X 120	1138
		72 X 144	1639
.375	3/0	48 X 120	689
		48 X 144	828
		60 X 144	1034
.1875	1/0	48 X 120	480
.250	3	36 X 96	278
		48 X 120	464

## INCONEL "X" SHEET

New Designation:

**INCONEL alloy X-750**

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
.250	3	36 X 96	257.3
.187	7	36 X 120	240.7
.156	9	36 X 96	160.6
.125	11	36 X 96	128.7
		36 X 120	160.9
.109	12	36 X 96	112.2
.100	—	36 X 120	128.7
.093	13	36 X 96	95.8
.090	—	36 X 120	115.8
.080	—	36 X 120	103.0
.078	14	36 X 96	80.3
.070	15	36 X 120	90.1

Hot Rolled, Annealed,  
and Pickled

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
.187	7	36 X 96	209
		48 X 120	351
.156	9	48 X 120	273.2
.140	10	48 X 120	247.6
.125	11	36 X 96	133.4
		48 X 120	221.2
		48 X 144	262.7
.109	12	36 X 96	114.5
		48 X 120	192.8
.093	13	36 X 96	97.7
		48 X 120	164.4
.078	14	36 X 96	81.9
		48 X 120	138.0
.062	16	36 X 96	65.1
		48 X 120	109.6
.050	18	36 X 96	53.0
.031	22	36 X 96	32.6

Cold Rolled, Annealed  
and Pickled

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
.062	16	36 X 96	63.8
		36 X 108	71.8
		36 X 120	79.8
.050	18	36 X 96	51.5
		36 X 120	64.4
.045	—	36 X 120	58.0
.043	19	36 X 96	44.3
.040	—	36 X 120	51.5
.031	22	36 X 96	31.9
.025	24	36 X 96	25.7
.021	25	36 X 96	21.6

ROD • SHAPES • WIRE

TUBING • PIPE

INDUSTRIAL PRODUCTS

WEIGHTS

FOUNDRY • WELDING  
BRAZING PRODUCTS

# MONEL-NICKEL

## INCOLOY SHEET

New Designation:  
INCOLOY alloy 800

Hot Rolled, Annealed,  
and Pickled

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
.250	3	36 X 120	312.0
		48 X 120	416.0
.187	7	48 X 120	310.4
.125	11	36 X 120	155.4
		48 X 120	207.2
.109	12	36 X 120	135.6
		48 X 120	180.8

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Sheet
.093	13	48 X 120	155.3
.078	14	36 X 120	96.9
		48 X 120	129.2
.062	16	36 X 96	62.1
		36 X 120	77.1
		48 X 120	103.5

## INCOLOY PLATE

New Designation:  
INCOLOY alloy 800

Hot Rolled, Annealed  
and Pickled

Thick- ness in inches	U.S.S. Ga.	Size in inches	Pounds per Plate
.1875		72 X 144	603.2
.3125		72 X 144	995.9
.375	3/0	36 X 120	466.0
		72 X 144	1183.8

SEAMLESS  
STEEL TUB  
(Continued)

MONEL-NICKEL

(in

$\frac{3}{4}$

$\frac{7}{8}$

1

$1\frac{1}{4}$

\* Stocked



# MONEL-NICKEL

## NI-O-NEL

New Designation:

**NI-O-NEL alloy 825**

Ni-O-Nel is a nickel-base, corrosion-resisting alloy that is available in the following mill forms:

Hot rolled plate and rod  
Cold rolled sheet and strip  
Seamless pipe and tubing  
Extruded seamless tubing  
Cold drawn rod

You can determine the weight per square foot of Ni-O-Nel by referring to the table on page 163. Additional technical information is given in the Data Section under the MONEL-NICKEL tab.

## MONEL ROUND ROD

New Designation:

**MONEL alloy 400**

Hot Rolled

Special Bolt Tolerance

Random Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{3}{8}$	.423	1	3.01
$\frac{5}{8}$	1.17	$1\frac{1}{8}$	3.81
$\frac{3}{4}$	1.69	$1\frac{1}{4}$	4.70

# MONEL-NICKEL



## MONEL ROUND ROD

New Designation:

**MONEL alloy 400**

Hot Rolled

6 to 24 Foot Random Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{4}$	.182	$1\frac{1}{8}$	3.81	$2\frac{3}{4}$	22.7
$\frac{5}{16}$	.294	$1\frac{3}{16}$	4.24	$2\frac{7}{8}$	24.9
$\frac{3}{8}$	.423	$1\frac{5}{8}$	5.68	3	27.1
$\frac{7}{16}$	.575	$1\frac{7}{16}$	6.21	$3\frac{1}{8}$	29.4
$\frac{1}{2}$	.752	$1\frac{1}{2}$	6.75	$3\frac{1}{4}$	31.8
$\frac{9}{16}$	.951	$1\frac{5}{8}$	7.94	$3\frac{3}{8}$	34.2
$\frac{5}{8}$	1.17	$1\frac{3}{4}$	9.21	$3\frac{1}{2}$	36.8
$1\frac{1}{16}$	1.42	$1\frac{7}{8}$	10.6	$3\frac{3}{4}$	42.3
$\frac{3}{4}$	1.69	2	12.0	4	48.1
$1\frac{1}{16}$	1.98	$2\frac{1}{8}$	13.6	$4\frac{1}{8}$	51.2
$\frac{7}{8}$	2.30	$2\frac{1}{4}$	15.2	$4\frac{1}{4}$	54.3
$1\frac{5}{16}$	2.64	$2\frac{3}{8}$	17.0	$4\frac{1}{2}$	60.9
1	3.01				



## MONEL ROUND ROD

New Designation:

**MONEL alloy 400**

Cold Drawn

6 to 20 Foot Random Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{16}$	.0118	$\frac{3}{4}$	1.69	$1\frac{9}{16}$	7.34
$\frac{3}{32}$	.0262	$1\frac{1}{16}$	1.96	$1\frac{5}{8}$	7.94
$\frac{1}{8}$	.047	$\frac{7}{8}$	2.30	$1\frac{11}{16}$	8.56
$\frac{3}{16}$	.106	$1\frac{5}{16}$	2.64	$1\frac{3}{4}$	9.21
$\frac{7}{32}$	.144	1	3.01	$1\frac{13}{16}$	9.88
$\frac{1}{4}$	.188	$1\frac{1}{16}$	3.39	$1\frac{7}{8}$	10.6
$\frac{5}{16}$	.294	$1\frac{1}{8}$	3.81	2	12.0
$\frac{3}{8}$	.423	$1\frac{3}{16}$	4.24	$2\frac{1}{8}$	13.6
$\frac{7}{16}$	.575	$1\frac{1}{4}$	4.70	$2\frac{1}{4}$	15.2
$\frac{1}{2}$	.752	$1\frac{5}{16}$	5.18	$2\frac{3}{8}$	17.0
$\frac{9}{16}$	.951	$1\frac{3}{8}$	5.68	$2\frac{1}{2}$	18.8
$\frac{5}{8}$	1.17	$1\frac{7}{16}$	6.21	$2\frac{3}{4}$	22.7
$1\frac{1}{16}$	1.42	$1\frac{1}{2}$	6.76	3	27.1

\* S

# MONEL-NICKEL



## MONEL ROUND ROD

New Designation:

**MONEL alloy 400**

**Cold Drawn,  
Precision Straightened**

**10 to 26 Foot Lengths**

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
* 1/2	.751	* 1 1/4	4.70	* 2	12.0
* 9/16	.951	1 5/16	5.18	2 1/16	12.8
* 5/8	1.17	* 1 3/8	5.68	2 3/16	14.4
* 11/16	1.42	1 7/16	6.21	* 2 1/4	15.2
* 3/4	1.69	* 1 1/2	6.76	2 3/8	17.0
* 13/16	1.98	1 9/16	7.34	2 7/16	17.9
* 7/8	2.30	* 1 5/8	7.94	* 2 1/2	18.8
* 15/16	2.64	1 11/16	8.56	* 2 3/4	22.7
* 1	3.01	* 1 3/4	9.21	* 3	27.1
1 1/16	3.39	1 13/16	9.88	* 3 1/4	31.8
* 1 1/8	3.81	* 1 7/8	10.6	* 3 1/2	36.8
1 3/16	4.24	1 5/16	11.3	* 4	48.1

\*This is standard size for use as Monel boat shafting. To determine proper shaft diameter, see chart in Data Section under MONEL-NICKEL tab.

## MONEL ROUND ROD

New Designation:

**MONEL alloy 400**

**Cold Rolled**

**QQN-281A, Amend. 1, Class A  
Stress Equalized Temper**

**6 to 16 Foot Random Lengths**

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
1/8	.047	3/4	1.69
1/2	.752	7/8	2.30
9/16	.951	1 3/8	5.68
5/8	1.17		

INDUSTRIAL PRODUCTS

TUBING • PIPE

WEIGHTS

DATA  
FOUNDRY • WELDING  
BRAZING PRODUCTS



# MONEL-NICKEL



## MONEL ROUND ROD

New Designation:  
MONEL alloy 400

Forged and Rough Turned  
2 to 12 Foot Random Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
4 $\frac{3}{8}$	57.5	5 $\frac{1}{8}$	79.1	7 $\frac{1}{8}$	152.5
4 $\frac{1}{2}$	60.9	5 $\frac{1}{2}$	90.9	8	192.0
4 $\frac{3}{4}$	67.8	6	108.0	8 $\frac{1}{8}$	198.5
5	75.2	6 $\frac{1}{8}$	112.5		

## MONEL ROUND ROD

New Designation:  
MONEL alloy 400

Hot Rolled  
Forging Quality  
Random Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
1 $\frac{11}{16}$	8.56	3 $\frac{1}{4}$	31.8	5 *	75.2
1 $\frac{7}{8}$	10.6	3 $\frac{1}{2}$ *	36.8	6 *	108.0
2	12.0	3 $\frac{3}{8}$	39.5	8	192.0
2 $\frac{1}{4}$	15.2	4	48.1	10	301.0
2 $\frac{1}{2}$	18.8	4 $\frac{1}{8}$	51.2		
2 $\frac{5}{8}$	20.7	4 $\frac{1}{4}$	54.3		

\* Also available as rough turned.

SEAMLESS  
STEEL TUBES

(Continued)

(in)

MONEL-NICKEL

3/4

7/8

1

1 1/4

\* Stocked

# MONEL-NICKEL

## "K" MONEL ROUND ROD

New Designation:

**MONEL alloy K-500**

Cold Drawn

Age Hardened

6 to 16 Foot Random Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{2}$	.718	$1\frac{3}{8}$	5.43	$2\frac{3}{8}$	16.2
$\frac{5}{8}$	1.11	$1\frac{1}{2}$	6.46	$2\frac{1}{2}$	17.9
$\frac{3}{4}$	1.61	$1\frac{5}{8}$	7.59	$2\frac{5}{8}$	19.7
$\frac{7}{8}$	2.19	$1\frac{3}{4}$	8.80	$2\frac{3}{4}$	21.7
1	2.87	2	11.4	3	25.9
$1\frac{1}{8}$	3.64	$2\frac{1}{8}$	13.0	$3\frac{1}{8}$	28.1
$1\frac{1}{4}$	4.49	$2\frac{1}{4}$	14.5	$3\frac{1}{4}$	30.4

## "K" MONEL ROUND ROD

New Designation:

**MONEL alloy K-500**

Cold Drawn, Heat Treated,  
Precision Straightened

6 to 20 Foot Random Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
* $\frac{3}{8}$	.406	$1\frac{3}{16}$	4.07	$2\frac{1}{8}$	13.0
* $\frac{7}{16}$	.551	$1\frac{1}{4}$	4.51	$2\frac{3}{16}$	14.0
$\frac{1}{2}$	.720	$1\frac{5}{16}$	4.97	$2\frac{1}{4}$	14.6
* $\frac{9}{16}$	.912	$1\frac{3}{8}$	5.45	$2\frac{3}{8}$	16.3
$\frac{5}{8}$	1.12	$1\frac{7}{16}$	5.96	$2\frac{1}{2}$	18.0
$\frac{3}{4}$	1.62	$1\frac{1}{2}$	6.48	$2\frac{5}{8}$	19.7
$\frac{7}{8}$	2.21	* $1\frac{9}{16}$	7.04	$2\frac{3}{4}$	21.8
$1\frac{1}{16}$	2.53	$1\frac{5}{8}$	7.61	3	25.9
1	2.89	$1\frac{3}{4}$	8.83	$3\frac{1}{8}$	28.1
$1\frac{1}{8}$	3.25	$1\frac{7}{8}$	10.2	$3\frac{1}{4}$	30.4
$1\frac{1}{8}$	3.65	2	11.5		

\*Not precision straightened — 6 and 12 foot random lengths.

# MONEL-NICKEL

## "K" MONEL ROUND ROD

New Designation:  
**MONEL alloy K-500**

**Cold Drawn, Not Heat Treated**

**6 to 20 Foot Random Lengths**

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
1 1/4	4.51	1 1/2	6.48	2 1/2	18.0
1 5/16	4.97	1 5/8	7.61	2 3/4	21.8
1 3/8	5.45	1 3/4	8.83	3	25.9
1 7/16	5.96	2	11.5	3 1/8	28.1
		2 1/4	14.6		

## "K" MONEL ROUND ROD

New Designation:  
**MONEL alloy K-500**

**Hot Rolled**

**Age Hardened**

**Random Lengths**

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
5/8	1.11	1 5/8	7.59	2 5/8	19.7
3/4	1.61	1 3/4	8.80	2 3/4	21.7
1	2.87	1 7/8	10.1	2 7/8	23.8
1 1/8	3.64	2	11.4	3	25.9
1 3/16	4.05	2 1/8	13.0	3 1/8	28.1
1 1/4	4.49	2 1/4	14.5	4	45.9
1 3/8	5.43	2 3/8	16.2	4 1/8	48.9
1 1/2	6.46	2 1/2	17.9		

## "K" MONEL ROUND ROD

New Designation:  
**MONEL alloy K-500**

**Forging Quality**

**As Forged As Turned**

**Random Lengths**

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
4	45.9	8	183.0
6	103.0	10	287.0

SEAMLESS  
STEEL

(Continued)

MONEL-NICKEL

\* Stocked



# MONEL-NICKEL



## "KR" MONEL ROUND ROD

New Designation:  
MONEL alloy 501



Cold Drawn, Not Heat Treated  
Free Machining  
6 to 20 Foot Random Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{3}{16}$	.101	$\frac{3}{4}$	1.62	$1\frac{3}{8}$	5.45
$\frac{1}{4}$	.180	$\frac{7}{8}$	2.21	$1\frac{1}{2}$	6.48
$\frac{5}{16}$	.282	$1\frac{5}{16}$	2.53	$1\frac{5}{8}$	7.61
$\frac{3}{8}$	.406	1	2.89	$1\frac{3}{4}$	8.83
$\frac{7}{16}$	.551	$1\frac{1}{8}$	3.65	$1\frac{7}{8}$	10.2
$\frac{1}{2}$	.720	$1\frac{1}{4}$	4.51	$1\frac{15}{16}$	10.8
$\frac{5}{8}$	1.12	$1\frac{5}{8}$	4.97	2	11.5



## "R" MONEL ROUND ROD

New Designation:  
MONEL alloy R-405



Free Machining, Cold Drawn  
6 to 20 Foot Random Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{16}$	.0118	$\frac{17}{32}$	.849	$1\frac{3}{16}$	4.24
$\frac{3}{32}$	.0262	$\frac{9}{16}$	.951	$1\frac{1}{4}$	4.70
$\frac{1}{8}$	.047	$\frac{19}{32}$	1.06	$1\frac{5}{16}$	5.18
$\frac{5}{32}$	.0733	.600	1.08	$1\frac{3}{8}$	5.68
$\frac{3}{16}$	.106	$\frac{5}{8}$	1.17	$1\frac{7}{16}$	6.21
$\frac{13}{64}$	.124	$\frac{11}{16}$	1.42	$1\frac{1}{2}$	6.76
$\frac{7}{32}$	.144	$\frac{23}{32}$	1.55	$1\frac{9}{16}$	7.34
$\frac{15}{64}$	.167	$\frac{3}{4}$	1.69	$1\frac{5}{8}$	7.94
$\frac{1}{4}$	.188	$\frac{25}{32}$	1.84	$1\frac{11}{16}$	8.56
$\frac{17}{64}$	.213	$\frac{13}{16}$	1.98	$1\frac{3}{4}$	9.21
$\frac{9}{32}$	.238	$\frac{27}{32}$	2.14	$1\frac{13}{16}$	9.88
$\frac{19}{64}$	.266	$\frac{7}{8}$	2.30	$1\frac{7}{8}$	10.6
$\frac{5}{16}$	.293	$\frac{29}{32}$	2.47	$1\frac{15}{16}$	11.3
$\frac{23}{64}$	.385	$\frac{15}{16}$	2.64	2	12.0
$\frac{3}{8}$	.423	$\frac{31}{32}$	2.82	$2\frac{1}{8}$	13.6
$\frac{13}{32}$	.496	1	3.01	$2\frac{3}{16}$	14.4
$\frac{27}{64}$	.535	$1\frac{1}{16}$	3.39	$2\frac{1}{4}$	15.2
$\frac{7}{16}$	.575	$1\frac{1}{8}$	3.81	$2\frac{3}{8}$	17.0
$\frac{1}{2}$	.751	$1\frac{5}{32}$	4.02	$2\frac{1}{2}$	18.8

# MONEL-NICKEL

## "A" NICKEL ROUND ROD

New Designation:  
**NICKEL 200**

**Cold Drawn**

**6 to 20 Foot Random Lengths**

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$ *	.047	$\frac{5}{8}$	1.18	$1\frac{1}{2}$	6.80
$\frac{5}{32}$ *	.073	$\frac{3}{4}$	1.70	$1\frac{3}{4}$	9.27
$\frac{3}{16}$ †	.106	$\frac{7}{8}$	2.31	2	12.07
$\frac{1}{4}$ †	.189	1	3.03	$2\frac{1}{4}$	15.2
$\frac{5}{16}$ †	.295	$1\frac{1}{4}$	4.73	$2\frac{1}{2}$	18.9
$\frac{3}{8}$ †	.425	$1\frac{3}{8}$	5.71	3	27.2
$\frac{1}{2}$	.76				

\* 6 Foot Lengths

† 10 to 12 Foot Lengths



## "A" NICKEL ROUND ROD

New Designation:  
**NICKEL 200**

**Hot Rolled  
Rough Turned  
Forging Quality**

**2 to 12 Foot Random Lengths**

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$1\frac{1}{16}$	8.7	$2\frac{5}{8}$	20.8	$4\frac{1}{2}$	61.3
$1\frac{7}{8}$	10.7	3	27.2	6	108.6
$2\frac{1}{2}$	18.9	$4\frac{1}{4}$	54.4	8	192.0

\* Stock

# MONEL-NICKEL



## INCONEL ROUND ROD

New Designation:

**INCONEL alloy 600**

Diameter (in inches)	Pounds per Lineal Foot
1/4	.180
5/16	.280
3/8	.403
1/2	.716
5/8	1.12
3/4	1.61



Hot Rolled

6 to 24 Foot Random Lengths

Diameter (in inches)	Pounds per Lineal Foot
1	2.87
1 1/4	4.48
1 1/2	6.45
1 3/4	8.77
2	11.43



## INCONEL ROUND ROD

New Designation:

**INCONEL alloy 600**

Diameter (in inches)	Pounds per Lineal Foot
1/4	.180
5/16	.280
3/8	.403
7/16	.548
1/2	.716
5/8	1.12
3/4	1.61
7/8	2.20
1	2.87



Hot Rolled, Annealed and Pickled

6 to 16 Foot Random Lengths

Diameter (in inches)	Pounds per Lineal Foot
1 1/8	3.63
1 1/4	4.48
1 1/2	6.45
1 5/8	7.57
1 3/4	8.77
2	11.43
2 1/2	17.95
3	25.73

INDUSTRIAL PRODUCTS

TUBING • PIPE

WEIGHTS

DATA  
FOUNDRY • WELDING  
BRAZING PRODUCTS



# MONEL-NICKEL

## INCONEL ROUND ROD

New Designation:  
**INCONEL alloy 600**

Hot Rolled  
Forging Quality  
Random Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{11}{16}$	1.35	$1\frac{1}{2}$ *	6.44	$2\frac{5}{8}$ *	20.72
$\frac{7}{8}$	2.19	$1\frac{11}{16}$ *	8.16	$4\frac{1}{4}$	54.0
$\frac{3}{4}$	1.63	$1\frac{3}{4}$ *	8.77	6	108.0
1	2.86	$1\frac{7}{8}$ *	10.10	8.75	219.0
$1\frac{1}{4}$ *	4.47	$2\frac{3}{8}$ *	16.20	10.7	344.0

\* Turned Finish

## INCONEL ROUND ROD

New Designation:  
**INCONEL alloy 600**

Cold Drawn  
6 to 16 Foot Random  
Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{4}$	.179	$\frac{3}{4}$	1.61	$1\frac{1}{8}$	3.63
$\frac{3}{8}$	.403	$\frac{13}{16}$	1.88	$1\frac{1}{4}$	4.47
$\frac{7}{16}$	.547	$\frac{7}{8}$	2.19	2	11.4
$\frac{1}{2}$	.716	$1\frac{1}{8}$	2.51	$2\frac{1}{4}$	14.1
$\frac{5}{8}$	1.11	1	2.86	$2\frac{1}{2}$	17.9

## INCONEL "X" ROUND ROD

New Designation:  
**INCONEL alloy X-750**

Hot Rolled  
Machining Quality  
Equalized Temper  
Random Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{3}{4}$ *	1.57	$1\frac{3}{8}$	5.30	$3\frac{5}{8}$	36.8
$\frac{7}{8}$ *	2.14	$1\frac{7}{8}$	9.90	$4\frac{1}{4}$	50.7
1	2.81	$2\frac{1}{4}$	14.1	$4\frac{5}{8}$	60.1
$1\frac{1}{8}$	3.55	$2\frac{1}{2}$	17.5		

\* Ground Finish

SEAMLESS  
STEEL

(Continued)

MONEL-NICKEL

# MONEL-NICKEL

INDUSTRIAL PRODUCTS

TUBING • PIPE

WEIGHTS

FOUNDRY • WELDING  
BRAZING PRODUCTS

## INCONEL "X" ROUND ROD

New Designation:

INCONEL alloy X-750

Hot Rolled

Machining Quality

As Rolled Temper

Random Lengths

Diameter (in inches)		Pounds per Foot	Diameter (in inches)		Pounds per Foot
$\frac{1}{2}$	Ground Finish	.702	$2\frac{1}{2}$	Rough Turned	17.5
$\frac{3}{4}$	" "	1.57	3	" "	25.3
1	Rough Turned	2.81	$4\frac{1}{2}$	Rough Turned	56.8
$1\frac{1}{4}$	" "	4.38		Forging Quality	

## INCONEL "X" ROUND ROD

New Designation:

INCONEL alloy X-750

Hot Finished

Machining Quality

Fully Heat Treated

Random Lengths

Diameter (in inches)		Pounds per Lineal Foot
$\frac{13}{16}$	Ground Finish	1.85
$2\frac{7}{8}$	Turned Finish	23.26
$3\frac{1}{4}$	Turned Finish	29.70

## INCONEL "X" ROUND ROD

New Designation:

INCONEL alloy X-750

Hot Finished

Forging Quality

Random Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
Ground Finish		Turned Finish	
$\frac{3}{4}$	1.58	$1\frac{7}{8}$	9.90
$\frac{7}{8}$	2.15	$2\frac{1}{8}$	12.70
$1\frac{3}{16}$	3.96	$2\frac{3}{4}$	21.40
$1\frac{3}{8}$	5.32	$3\frac{3}{4}$	39.51
$1\frac{1}{2}$	6.31		

# MONEL-NICKEL

## INCONEL "X" ROUND FORGING ROD

New Designation:  
INCONEL alloy X-750

As Forged  
Rough Turned  
Random Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{3}{4}$	1.57	$2\frac{1}{8}$	12.70
$1\frac{3}{16}$	1.85	$2\frac{3}{4}$	21.20
$\frac{7}{8}$	2.15	$2\frac{7}{8}$	23.26
$1\frac{3}{16}$	3.96	$3\frac{1}{4}$	29.70
$1\frac{1}{4}$	4.39	6	101.0
$1\frac{3}{8}$	5.30	$8\frac{3}{4}$	215.0

## INCOLOY ROUND ROD

New Designation:  
INCOLOY alloy 800

Hot Rolled Annealed,  
and Pickled  
6 to 18 Foot Random Lengths

Diameter (in inches)	Pounds per Foot	Diameter (in inches)	Pounds per Foot
$\frac{1}{4}$	.170	$\frac{7}{8}$	2.09
$\frac{5}{16}$	.267	1	2.73
$\frac{3}{8}$	.384	$1\frac{1}{4}$	4.27
$\frac{7}{16}$	.522	$1\frac{1}{2}$	6.14
$\frac{1}{2}$	.683	2	10.9
$\frac{5}{8}$	1.06	$2\frac{1}{2}$	17.0
$\frac{3}{4}$	1.53		



## DURANICKEL ROUND ROD

New Designation:  
DURANICKEL alloy 301

Cold Drawn, Heat Treated  
6 to 20 Foot Random Lengths

Diameter (in inches)	Pounds per Lineal Foot	Diameter (in inches)	Pounds per Lineal Foot
$\frac{1}{2}$	.70	$\frac{7}{8}$	2.15
$\frac{5}{8}$	1.09	1	2.81
$\frac{3}{4}$	1.58	$1\frac{1}{8}$	3.56

SEAMLESS  
STEEL

(Continued)

MONEL-NICKEL

$\frac{3}{4}$

$\frac{7}{8}$

1

$1\frac{1}{4}$

\* Stock



# MONEL-NICKEL



## MONEL SQUARE ROD

New Designation:

**MONEL alloy 400**

**Cold Drawn**

**6 to 20 Foot Random Lengths**

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
1/4	.24	9/16	1.21	7/8	2.93
5/16	.374	5/8	1.50	1	3.83
3/8	.538	11/16	1.81	1 1/4	5.98
1/2	.957	3/4	2.15	1 1/2	8.61

## MONEL SQUARE ROD

New Designation:

**MONEL alloy 400**

**Hot Rolled**

**6 to 16 Foot Random  
Lengths**

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
5/16	.374	7/8	2.93
3/8	.538	1	3.83
1/2	.957	1 1/4	5.98
5/8	1.50	1 1/2	8.61
3/4	2.15	2	15.3

## MONEL SQUARE FORGING BILLETS

New Designation:

**MONEL alloy 400**

**Hot Finished**

Size (in inches)	Pounds per Lineal Foot
8	245
10	383
12	551

INDUSTRIAL PRODUCTS

TUBING • PIPE

WEIGHTS

FOUNDRY • WELDING  
BRAZING PRODUCTS

DATA

# MONEL-NICKEL



## "R" MONEL SQUARE ROD

New Designation:  
MONEL alloy R-405

Cold Drawn, Free Machining

6 to 20 Foot Random Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{3}{8}$	.538	$\frac{5}{8}$	1.50	$\frac{7}{8}$	2.93
$\frac{1}{2}$	.957	$\frac{3}{4}$	2.15	1	3.83

## INCONEL SQUARE FORGING ROD

New Designation:  
INCONEL alloy 600

Hot Finish

Random Lengths

Size (in inches)	Pounds per Lineal Foot
2	14.58
$2\frac{1}{2}$	22.77
3	32.88



## MONEL HEXAGONAL ROD

New Designation:  
MONEL alloy 400

Cold Drawn

6 to 20 Foot Random Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{3}{8}$	.466	$\frac{3}{4}$	1.87	$1\frac{3}{8}$	6.27
$\frac{1}{2}$	.829	$1\frac{3}{16}$	2.19	$1\frac{1}{2}$	7.46
$\frac{9}{16}$	1.05	$\frac{7}{8}$	2.54	$1\frac{11}{16}$	9.43
$\frac{5}{8}$	1.30	1	3.32	$1\frac{3}{4}$	10.2
$1\frac{1}{16}$	1.57	$1\frac{1}{4}$	5.18		

SEAM  
STEEL  
(Cont

MONEL-NICKEL

# MONEL-NICKEL

## MONEL HEXAGONAL ROD

New Designation:  
**MONEL alloy 400**

Hot Rolled  
As Rolled Temper

6 to 16 Foot Random  
Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
1/2	.829	1	3.32	1 5/8	8.75
9/16	1.05	1 1/8	4.20	2	13.3
3/4	1.87	1 1/4	5.18	2 1/8	15.0
7/8	2.54	1 7/16	6.85	2 3/8	18.7
1 5/16	2.91	1 1/2	7.46	2 1/2	20.7



## "KR" MONEL HEXAGONAL ROD

New Designation:  
**MONEL alloy 501**

Cold Drawn

6 to 20 Foot Random Lengths

Size (in inches)	Pounds per Lineal Foot
1/2	.795
3/4	1.79
7/8	2.44



## "R" MONEL HEXAGONAL ROD

New Designation:  
**MONEL alloy R-405**

Cold Drawn, Free Machining

6 to 20 Foot Random Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
1/4	.207	3/4	1.87	1 5/16	5.71
5/16	.324	13/16	2.19	1 3/8	6.27
3/8	.466	7/8	2.54	1 7/16	6.85
7/16	.635	1 5/16	2.91	1 1/2	7.46
1/2	.829	1	3.32	1 5/8	8.75
9/16	1.05	1 1/16	3.74	1 3/4	10.2
5/8	1.30	1 1/8	4.20	1 7/8	11.7
1 1/16	1.57	1 1/4	5.18	2	13.3

INDUSTRIAL PRODUCTS

TUBING • PIPE

WEIGHTS

DATA  
FOUNDRY • WELDING  
BRAZING PRODUCTS



# MONEL-NICKEL

## MONEL RECTANGULAR ROD

New Designation:  
**MONEL alloy 400**

Hot Rolled, Annealed,  
Pickled  
6 to 24 Foot Random Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{8} \times \frac{1}{2}$	.239	$\frac{1}{4} \times \frac{1}{4}$	1.68	$\frac{1}{2} \times 2$	3.83
$\frac{3}{4}$	.359	2	1.91	$2\frac{1}{2}$	4.79
1	.479	$2\frac{1}{2}$	2.39	3	5.74
$1\frac{1}{4}$	.598	3	2.87	4	7.66
$1\frac{1}{2}$	.718	4	3.83	$\frac{5}{8} \times 1$	2.39
2	.957	$\frac{5}{16} \times 1$	1.20	$1\frac{1}{4}$	2.99
$2\frac{1}{2}$	1.20	$\frac{3}{8} \times \frac{3}{4}$	1.08	2	4.79
$\frac{3}{16} \times \frac{1}{2}$	.359	1	1.44	$2\frac{1}{2}$	5.98
$\frac{3}{4}$	.538	$1\frac{1}{4}$	1.79	$\frac{3}{4} \times 1$	2.87
1	.718	$1\frac{1}{2}$	2.15	$1\frac{1}{2}$	4.31
$1\frac{1}{4}$	.897	$1\frac{3}{4}$	2.51	2	5.74
$1\frac{1}{2}$	1.08	2	2.87	$2\frac{1}{2}$	7.18
2	1.44	$2\frac{1}{2}$	3.59	3	8.61
$\frac{1}{4} \times \frac{1}{2}$	.479	3	4.31	4	11.5
$\frac{3}{4}$	.718	4	5.74	$1 \times 2$	7.66
1	.957	$\frac{1}{2} \times 1$	1.91	3	11.5
$1\frac{1}{4}$	1.20	$1\frac{1}{4}$	2.39		
$1\frac{1}{2}$	1.44	$1\frac{1}{2}$	2.87		

## INCONEL RECTANGULAR ROD

New Designation:  
**INCONEL alloy 600**

Hot Rolled, Annealed,  
and Pickled

12 to 16 Foot Random Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{8} \times \frac{1}{2}$	.227	$\frac{3}{16} \times 2$	1.37	$\frac{3}{8} \times 2\frac{1}{2}$	3.42
$\frac{3}{4}$	.342	$\frac{1}{4} \times \frac{3}{4}$	.684	3	4.10
1	.456	1	.912	$\frac{1}{2} \times 1$	1.82
$1\frac{1}{2}$	.684	$1\frac{1}{4}$	1.14	$1\frac{1}{2}$	2.73
2	.912	$1\frac{1}{2}$	1.37	2	3.64
$\frac{3}{16} \times \frac{3}{4}$	.512	2	1.82	$2\frac{1}{2}$	4.56
1	.684	$\frac{3}{8} \times 1$	1.37	3	5.47
$1\frac{1}{4}$	.854	$1\frac{1}{2}$	2.04	$\frac{5}{8} \times 2$	4.56
$1\frac{1}{2}$	1.02	2	2.73	$\frac{3}{4} \times 1\frac{1}{2}$	4.32

SEAM  
STEEL  
(Cont)

MONEL-NICKEL

# MONEL-NICKEL

## INCOLOY RECTANGULAR ROD

New Designation  
INCOLOY alloy 800

Hot Rolled, Annealed,  
and Pickled

12 to 16 Foot Random Lengths

Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot	Size (in inches)	Pounds per Lineal Foot
$\frac{1}{8} \times 1$	.435	$\frac{1}{4} \times 1\frac{1}{2}$	1.30	$\frac{3}{8} \times 2$	2.60
$\frac{3}{16} \times 1$	.652	$\frac{3}{8} \times 1$	1.44	$\frac{1}{2} \times 2$	3.48
$\frac{1}{4} \times 1$	.869	$\frac{1}{2}$	1.95	$\frac{5}{8} \times 2$	4.35



## MONEL ANGLES

New Designation:  
MONEL alloy 400

Size (in inches)	Pounds per Foot
$1 \times 1 \times \frac{1}{8}$	.90
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{8}$	1.14
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{16}$	1.66
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{4}$	2.15
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$	1.38
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{16}$	2.02



## MONEL ANGLES

New Designation:  
MONEL alloy 400

Size (in inches)	Pounds per Foot
$1 \times 1 \times \frac{1}{8}$	.90
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{8}$	1.14
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{16}$	2.02
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{4}$	2.63



Hot Rolled, Annealed

6 to 24 Foot Random Lengths

Size (in inches)	Pounds per Foot
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{4}$	2.63
$2 \times 2 \times \frac{1}{8}$	1.85
$2 \times 2 \times \frac{3}{16}$	2.74
$2 \times 2 \times \frac{1}{4}$	3.59
$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{4}$	4.55
$3 \times 3 \times \frac{1}{4}$	5.50



Hot Rolled

6 to 24 Foot Random Lengths

Size (in inches)	Pounds per Foot
$2 \times 2 \times \frac{3}{16}$	2.74
$2 \times 2 \times \frac{1}{4}$	3.59
$3 \times 3 \times \frac{1}{4}$	5.50

INDUSTRIAL PRODUCTS

TUBING • PIPE

WEIGHTS

DATA  
FOUNDRY • WELDING  
BRAZING PRODUCTS

# MONEL-NICKEL

## INCONEL ANGLES

New Designation:  
INCONEL alloy 600

Hot Rolled, Annealed,  
and Pickled

12 to 16 Foot Random Lengths

Size (in inches)	Pounds per Lineal Foot
1 × 1 × 1/8	.857
1 × 1 × 3/16	1.23
1 × 1 × 1/4	1.59

Size (in inches)	Pounds per Lineal Foot
1 1/2 × 1 1/2 × 3/16	1.92
1 1/2 × 1 1/2 × 1/4	2.50
2 × 2 × 1/4	3.42

## INCOLOY ANGLES

New Designation:  
INCOLOY alloy 800

Hot Rolled, Annealed,  
and Pickled

12 to 16 Foot Random Lengths

Size (in inches)	Pounds per Foot
1 × 1 × 1/8	.818
1 × 1 × 3/16	1.18
1 × 1 × 1/4	1.51
1 1/2 × 1 1/2 × 1/4	2.39
2 × 2 × 1/4	3.26

## MONEL ROUND WIRE, SOFT

New Designation:  
MONEL alloy 400

5 lb. Spools or Random Coils

Size (in inches)	Pounds per 1000 Feet	Size (in inches)	Pounds per 1000 Feet	Size (in inches)	Pounds per 1000 Feet
.0159	.76	.0475	.0065	.072	15.56
.0253	1.92	.051	7.81	.125	46.97
.032	3.07	.064	12.30	.128	49.65
.040	4.80				

SEAM  
STEEL

(Conti

MONEL-NICKEL

3/4

7/8

1

1 1/4

\* Stoc



# MONEL-NICKEL

## ROUND SPRING TEMPER MONEL WIRE

New Designation:  
**MONEL alloy 400**

Random Coils

Size (in inches)	Pounds per 1000 Feet	Size (in inches)	Pounds per 1000 Feet	Size (in inches)	Pounds per 1000 Feet
.032	3.07	.081	19.65	.128	49.65
.040	4.80	.091	24.74	.144	62.62
.051	7.81	.102	31.27	.162	78.93
.064	12.30	.114	39.35	.187	105.69
.072	15.56	.125	46.97		

## OTHER WIRE

Monel Metallizing wire is available in Random Coils. Soft or Spring Temper wire, and Metallizing wire is available in other alloys on request. Call our representative or the sales office nearest you for additional information.

## MONEL TUBING

New Designation:  
**MONEL alloy 400**

Cold Drawn, Seamless  
Random Lengths

O.D. in inches	I.D. in inches	Wall in inches	Pounds per Lineal Foot	O.D. in inches	I.D. in inches	Wall in inches	Pounds per Lineal Foot
1/4	.180	.035	.090	3/4	.680	.035	.301
	.152	.049	.118		.620	.065	.536
5/16	.243	.035	.117	7/8	.805	.035	.354
3/8	.305	.035	.143		.745	.065	.633
	.277	.049	.192	1	.870	.065	.731
	.245	.065	.242		.834	.083	.915
1/2	.430	.035	.195	1 1/4	1.120	.065	.926
	.416	.042	.231	1 1/2	1.370	.065	1.12
	.370	.065	.340	2	1.870	.065	1.51
5/8	.527	.049	.340	2 1/4	2.120	.065	1.71
				2 1/2	2.334	.083	2.41

## MONEL CONDENSER TUBING

New Designation:  
**MONEL alloy 400**

Cold Drawn, Seamless  
Annealed  
Ends Deburred

O.D. in Inches	Wall in Inches	Length in Feet	Pounds per Lineal Foot	O.D. in Inches	Wall in Inches	Length in Feet	Pounds per Lineal Foot
3/4	.065	16	.535	3/4	.083	16	.666
3/4	.065	20	.535	1	.083	12	.915
3/4	.083	12	.666	1 1/4	.083	8	1.17

INDUSTRIAL PRODUCTS

TUBING • PIPE

WEIGHTS

DATA  
FOUNDRY • WELDING  
BRAZING PRODUCTS

# MONEL-NICKEL

## INCONEL TUBING

New Designation:  
INCONEL alloy 600

Cold Drawn

AMS 558

6 to 24 Foot Random Lengths

O.D. in inches	Wall in inches	Pounds per Lineal Foot	O.D. in inches	Wall in inches	Pounds per Lineal Foot
$\frac{1}{4}$	.049	.114	$\frac{9}{16}$	.035	.214
$\frac{5}{16}$	.035	.113	$\frac{5}{8}$	.035	.239
$\frac{3}{8}$	.035	.138	$\frac{7}{8}$	.035	.340
$\frac{1}{2}$	.035	.189			

## INCONEL "X" TUBING

New Designation:  
INCONEL alloy X-750

Cold Drawn,  
Seamless

10 to 20 Foot Random Lengths

O.D. in Inches	Wall in Inches	Pounds per Lineal Foot
$\frac{5}{16}$	.035	.113
$\frac{1}{2}$	.035	.189

## INCOLOY TUBING

New Designation:  
INCOLOY alloy 800

As Extruded, Medart  
Straightened, Pickled Finish

21, 22 Foot, 6 inch and  
23 Foot Exact Lengths

O.D. in inches	I.D. in inches	Wall in inches	Pounds per Lineal Foot
4 $\frac{1}{2}$	4.00	.250	13.17

SEAM  
STEEL  
(Cont

MONEL-NICKEL

$\frac{3}{4}$

$\frac{7}{8}$

1

1  $\frac{1}{4}$

\* Stock

# MONEL-NICKEL

## MONEL PIPE

New Designation:  
**MONEL alloy 400**

Cold Drawn, Seamless  
Standard Weight, Schedule 40  
10 to 20 Foot Random Lengths  
Also Available in Annealed  
Condition

I.P.S. (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
⅜	.405	.269	.068	.276
¼	.540	.364	.088	.478
⅜	.675	.493	.091	.639
½	.840	.622	.109	.958
¾	1.050	.824	.113	1.27
1	1.315	1.049	.133	1.89
1¼	1.660	1.380	.140	2.56
1½	1.900	1.610	.145	3.06
2	2.375	2.067	.154	4.11
2½	2.875	2.469	.203	6.52
3	3.500	3.068	.216	8.53
4	4.500	4.026	.237	12.14
6	6.625	6.065	.280	21.4
8	8.625	7.999	.313	32.2

## MONEL PIPE

New Designation:  
**MONEL alloy 400**

Cold Drawn, Seamless  
Schedule 10  
10 to 20 Foot Random Lengths  
Also Available in Annealed  
Condition

I.P.S. (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
1	1.315	1.097	.109	1.58
1½	1.900	1.682	.109	2.350
2	2.375	2.157	.109	2.97
3	3.500	3.260	.120	4.880
4	4.500	4.260	.120	6.320

INDUSTRIAL PRODUCTS

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BRAZING PRODUCTS



# MONEL-NICKEL

## MONEL PIPE

New Designation:  
**MONEL alloy 400**

Cold Drawn, Seamless

Extra Heavy, Schedule 80

10 to 20 Foot Random Lengths

Also Available in Annealed  
Condition

I.P.S. (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$	.405	.215	.095	.354
$\frac{1}{4}$	.540	.302	.119	.603
$\frac{3}{8}$	.675	.423	.126	.832
$\frac{1}{2}$	.840	.546	.147	1.230
$\frac{3}{4}$	1.050	.742	.154	1.660
1	1.315	.957	.179	2.450
1 $\frac{1}{4}$	1.660	1.278	.191	3.370
1 $\frac{1}{2}$	1.900	1.500	.200	4.090
2	2.375	1.939	.218	5.660
2 $\frac{1}{2}$	2.875	2.323	.276	8.630
3	3.500	2.900	.300	11.500
4	4.500	3.826	.337	16.900

## "A" NICKEL PIPE

New Designation:  
**NICKEL 200**

Cold Drawn, Seamless

Standard Weight, Schedule 40

10 to 20 Foot Random Lengths

Also Available in Annealed  
Condition, Stress Relieved, or  
Both

I.P.S. (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$	.405	.269	.068	.277
$\frac{1}{4}$	.540	.364	.088	.481
$\frac{3}{8}$	.675	.493	.091	.643
$\frac{1}{2}$	.840	.622	.109	.964
$\frac{3}{4}$	1.050	.824	.113	1.280
1	1.315	1.049	.133	1.900
1 $\frac{1}{4}$	1.660	1.380	.140	2.580
1 $\frac{1}{2}$	1.900	1.610	.145	3.080
2	2.375	2.067	.154	4.140
2 $\frac{1}{2}$	2.875	2.469	.203	6.560
3	3.500	3.068	.216	8.580
4	4.500	4.026	.237	12.200
6	6.625	6.065	.280	21.500
8	8.625	7.981	.322	32.39

SEAMLESS  
STEEL

(Cont)

MONEL-NICKEL

\* Stock

# MONEL-NICKEL

INDUSTRIAL PRODUCTS

## "A" NICKEL PIPE

Cold Drawn, Seamless

Schedule 10

10 to 20 Foot Random Lengths

Also Available in Annealed Condition, Stress Relieved, or Both

New Designation:  
NICKEL 200

I.P.S. (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
1/2	.840	.674	.083	.761
1	1.315	1.097	.109	1.589
1 1/2	1.900	1.682	.109	2.36
2	2.375	2.157	.109	2.990
2 1/2	2.875	2.635	.120	4.004
3	3.500	3.260	.120	4.910
4	4.500	4.260	.120	6.360
6	6.625	6.357	.134	10.513

WEIGHTS

## "A" NICKEL PIPE

Cold Drawn, Seamless

Extra Heavy, Schedule 80

10 to 20 Foot Random Lengths

Also Available in Annealed Condition, Stress Relieved, or Both

New Designation:  
NICKEL 200

I.P.S. (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
1/4	.540	.302	.119	.606
3/8	.675	.423	.126	.837
1/2	.840	.546	.147	1.23
3/4	1.050	.742	.154	1.670
1	1.315	.957	.179	2.460
1 1/4	1.660	1.278	.191	3.400
1 1/2	1.900	1.500	.200	4.120
2	2.375	1.939	.218	5.690
3	3.500	2.900	.300	11.600
4	4.500	3.826	.337	17.000

DATA  
FOUNDRY • WELDING  
BRAZING PRODUCTS

# MONEL-NICKEL

## INCONEL PIPE

New Designation:

**INCONEL alloy 600**

Seamless

Cold Drawn, Annealed, and  
Pickled

Standard Weight, Schedule 40  
10 to 20 Foot Random Lengths

I.P.S. (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
$\frac{1}{8}$	.405	.269	.068	.264
$\frac{1}{4}$	.540	.364	.088	.460
$\frac{3}{8}$	.675	.493	.091	.615
$\frac{1}{2}$	.840	.622	.109	.922
$\frac{3}{4}$	1.050	.824	.113	1.23
1	1.315	1.049	.133	1.82
$1\frac{1}{4}$	1.660	1.380	.140	2.46
$1\frac{1}{2}$	1.900	1.610	.145	2.95
2	2.375	2.067	.154	3.96
$2\frac{1}{2}$	2.875	2.469	.203	6.28
3	3.500	3.068	.216	8.21
4	4.500	4.026	.237	11.70
6	6.625	6.065	.280	20.39

## INCONEL PIPE

New Designation:

**INCONEL alloy 600**

Cold Drawn, Annealed  
Schedule 80

10 to 20 Foot Random Lengths

I.P.S. (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
$\frac{1}{2}$	.840	.546	.147	1.172
$\frac{3}{4}$	1.050	.742	.154	1.582

## INCOLOY PIPE

New Designation:

**INCOLOY alloy 800**

Cold Drawn, Annealed, and  
Pickled

Standard Weight, Schedule 40  
10 to 20 Foot Random Lengths

I.P.S. (in inches)	O.D. (in inches)	I.D. (in inches)	Wall (in inches)	Pounds per Lineal Foot
$\frac{1}{2}$	.840	.622	.109	.865
$\frac{3}{4}$	1.050	.824	.113	1.15
1	1.315	1.049	.133	1.71
$1\frac{1}{4}$	1.660	1.380	.140	2.31

SEAMLESS  
STEEL

(Continued)

MONEL-NICKEL

$\frac{3}{4}$

$\frac{7}{8}$

1

1

\* See





## WHAT DO YOU WANT TO KNOW ABOUT **FOUNDRY PRODUCTS**

Foundry additives and alloying technique have made tremendous advances in recent years. Proper addition of alloying elements improves qualities of corrosion resistance, toughness, hardness, and provides higher tensile strength.

Free literature on foundry products is available as well as advice and counsel of our foundry specialists and research departments of our suppliers.

## WHAT DO YOU WANT TO KNOW ABOUT **WELDING & BRAZING ALLOYS**

A considerable amount of literature on welding and brazing alloys, and the joining of metals by these processes, is yours free. Some of the booklets available are listed on the following page.

In addition, technical sales personnel are ready always to help you with your problems. Call, when you need assistance.



FOUNDRY

INDUSTRIAL PRODUCTS

WELDING • BRAZING

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Stainless Steel Electrodes & Wire.....	210, 211

The number and types of items carried in stock are always changing to meet customers' needs. If the product you want is not listed here, call or write our nearest warehouse sales office for additional information.

## LITERATURE REQUESTS

There are many technical booklets and pamphlets available to you, free. If you would like to receive information on a particular product or application, please write outlining your needs. We will do our best to help you find an answer.

# FOUNDRY WELDING BRAZING

## LITERATURE ON FOUNDRY PRODUCTS

A Quick Guide to Nickel-Containing Casting Alloys  
Vancoram Products  
Shieldalloy Products

## LITERATURE ON WELDING AND BRAZING PRODUCTS

Manual for Welding Stainless Steels

## Alcoa Filler Metal Selection Chart

Brazing Alcoa Aluminum  
Welding Alcoa Aluminum  
Anaconda Copper-Alloy  
Brazing and Welding Rods  
Inco Welding Products  
Inco-Weld A Electrode  
Brazing and Soldering Nickel and High-Nickel Alloys  
Fusion Welding of Nickel and High-Nickel Alloys  
Resistance Welding  
Welding Cast Irons Quickly and Easily with NI-ROD and NI-ROD "55" ELECTRODES

## Inco's Huntington Welding Materials

## Easy-Flo and Sil-Fos Brazing Alloys

## Brazing Alloy Selection Chart for Copper and Copper Alloys

## 7 Reasons Why Stainless Steels Should Be Joined by Silver and Gold Alloy Brazing

## Why HANDY FLUX is First by Far for Superior Low-Temperature Brazing

## TELEPHONES OF OFFICES AND WAREHOUSES

New York, New York  
.....Worth 4-2800  
Carteret, N. J. ....YOrktown 9-2000  
Cambridge, Mass.  
.....TRowbridge 6-4680  
Harrison N. J. ....HUMboldt 5-5900  
Philadelphia, Pa. ....BALdwin 9-2323  
Baltimore, Md. ....WInsdor 4-2000  
Buffalo, N. Y. ....TRIangle 6-3100  
Syracuse, N. Y. ....HOWard 3-6241  
Windsor, Conn. ....phone 688-4921  
Rochester, N. Y. ....BUtler 8-2141



## FOUNDRY ALLOY PRODUCTS

In recent years, tremendous strides have been made in improving the properties of the common engineering metals; for instance, advances in alloying techniques make possible the production of cast irons which are a far cry from the low-strength brittle casting of 25 years ago. By the proper addition of alloying elements improved qualities of corrosion resistance, toughness, hardness and higher tension strengths have been attained.

Special types of cast iron (Ni-Resist) have high heat and corrosion resistance, and one type (Ni-Hard) is hard enough to scratch glass, as does the diamond. Some irons can be stretched and bent, having an elongation as high as 25 to 30% with tensile strengths many times that of ordinary irons (ductile irons). Cast irons are being produced to match the thermal expansion of metals such as steel or aluminum or to minimum expansion specifications.

Cast iron is but one of the foundry products which has shown vast improvement. Steels and bronzes have been improved to meet the demands of industry for higher processing temperatures and accelerated operating speeds. The proper use of alloying materials such as nickel, chromium, molybdenum, silicon, vanadium, manganese, enables the foundryman today to meet his customer's most exacting specifications.

A user of castings may now go to his foundryman and ask for increased machinability with higher strength in a specified part, or higher ductility coupled with corrosion resistance, or if a need demands greater wear and heat resistance together with resistance to shock and impact, this, too, may be acquired by the proper and intelligent use of foundry alloying material. The foundry, as well as the user of castings, has available the experience and services of our foundry engineers, backed by the development and research departments of The International Nickel Company, Inc., The Vanadium Corporation of America Shieldalloy Corporation, and Climax Molybdenum Company.



# FOUNDRY PRODUCTS

## FOUNDRY PRODUCTS — NICKEL

### ELECTROLYTIC NICKEL SQUARES

**1" x 1", 4" x 4" — In Approximately 500-pound Drums**

**2" x 2", 9" x 9" " " 725-Pound "**

**4" x 4" Available in 1600- and 3000-Pound Fibreboard Boxes**

Electrolytic Nickel is the purest form of nickel produced in commercial quantities. It contains only a trace of sulphur and carbon. It is used principally for alloying with steel and for the production of nickel silver and pure nickel castings.

### "QM" (QUICK MELTING) ELECTRO SQUARES

**1" x 1" Thin Squares**

**In 425-Pound Drums**

A specialized form of electrolytic nickel in thin section for quick melting in the non-ferrous foundry. It is readily dissolved by molten brass, bronze and aluminum at temperatures below the melting point of nickel.

### NICKEL INGOTS

**Approximately 10 Pounds Each in 660-Pound Drums**

A demand for nickel in ingot form exists in the ferrous metal industries where this form is preferred to electrolytic nickel cathodes. It is used in the production of low alloy cast irons, Ni-Hard, and Ni-Resist.

### "XX" NICKEL SHOT

**475-Pound Drums**

Nickel Shot is one of the oldest commercial forms of nickel in use. Its major application is in those types of furnaces where its form and size is desirable. Its size is accomplished by screening to pass through a 1" opening, and remaining on a .053" opening.

### "F" NICKEL SHOT AND INGOT

**Shot in 500-Pound Drums**

**Ingots of Approximately 5 Pounds for Cupola Additions**

**Ingots Packed in 485-Pound Drums**

Developed especially for ladle additions in gray iron foundries. Silicon, iron, and carbon additives help reduce the melting point to approximately 2300° F. — below that of pure nickel (2640° F.) — and it assures rapid solution at even the lower temperature levels of molten iron. Shot is sized through  $\frac{1}{4}$ " screen opening and retained on .0193" opening. This facilitates efficient handling through funnels or other charging apparatus.

5-pound ingots are of optimum size for direct charging into the cupola for the volume production of nickel cast irons.

SEAMLESS  
STEEL

(Continued)

MONEL-NICKEL

FOUNDRIES • WELDING  
BRAZING PRODUCTS

# FOUNDRY PRODUCTS

## FOUNDRY PRODUCTS — NICKEL

### DUCTILE IRON ADDITIVES

The Ductile Iron Additives, nickel-magnesium (NMA No. 1) and nickel-magnesium-silicon (NMSA No. 2), are available from warehouse stocks to licensed producers of Ductile Iron. Either additive is available in a large or small size. The large size passes through 2 1/4" diameter to 3/4" diameter, and the small size passes through 1" diameter to be retained on 8 mesh.

These additives are employed in the licensed foundry production of Ductile Iron, which is a cast ferrous product that combines the process advantages of cast iron with many of the product advantages of cast steel. It offers excellent castability, high strength, good machinability, and marked resistance to wear and impact. Useful applications include gears, bearing sleeves, sprockets, crankshafts, wrenches, manifolds, compressor heads, and clamps, to mention just a few.

Using the process originated with Ductile Cast Iron, another versatile engineering material, Ductile Ni-Resist\* Cast Iron is now being produced by licensed foundries. The resistance of the Ni-Resist\* irons to corrosion, erosion, metal-to-metal wear and to elevated temperatures, plus their castability and machinability are retained in this alloy. Added advantages are strength and ductility approaching that of cast steel.

### NON-FERROUS ALLOYS AND INGOTS

#### Nickel Bronzes and Nickel Silvers

Additions of up to 5% of nickel to common brass and bronze foundry mixtures have long been recognized as an inexpensive and practical method of improving the properties of such mixtures. Nickel, when added to these mixes, increases the density (pressure tightness), raises the strength, and improves the toughness of the metal. Additions of approximately 5% nickel and 5% tin to copper have been found to yield the optimum combination of properties and economy. The Ni-Vee\* bronzes are a family of five such alloys whose compositions are pivoted around the 5% nickel, 5% tin level. In the "as cast" condition, Ni-Vee\* bronzes provide properties superior to those of comparable G bronze, red bronzes, and leaded bearing bronzes. Through simple heat treatments that control a nickel-tin copper precipitation reaction, the superior "as cast" properties of the Ni-Vee\* bronzes can be improved even further.

Completed information on the production and applications of Nickel Bronzes, and Nickel Silvers will be sent on request.

Available Literature: "Engineering Properties and Applications of Ni-Vee Bronzes".

\*Trade-Mark

INDUSTRIAL PRODUCTS

WELDING • BRAZING

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# FOUNDRY PRODUCTS

## ALSIFER

(Approx. 20% Al, 40% Si, 40% Fe)

## ALUMINUM

Grained Aluminum (99.5% Min. Al)

Titanium Aluminum (50% Ti grade)

Vanadium Aluminum (2½%, 5%, 40%, and 85% V)

Zirconium Aluminum (about 50-50 ratio)

Molybdenum Aluminum (60% Mo. - 40% Al)

Ingot

Hardeners

5½% Ti. Al.

0.1% B. 5% Ti. Al.

1.0% B. 5% Ti. Al.

10% Cr. Al.

15% Cr. Al.

20% Cr. Al.

5% Mn. Al.

7% Mn. Al.

10% Mn. Al.

## BORON

Ferroboron (14-18% B)

## CALCIUM SILICON

Calcium Silicon (30% Ca. - 60% Si.)

## CALSLOY

Calsloy (12-16% Ca., 55-60% Si. Bal. Fe.)

## CHROMIUM

Chromium Metal - High Carbon

Chromium Metal - "99"

Chromium Metal - Vacuum Melting Grade

Chromium Columbium (35% Cr, 65% Cb)

Chromium Tungsten (60% Cr, 40% W)

Chromium Molybdenum (68% Cr, 30% Mo or 28% Cr, 70% MO)

## FERROCHROMIUM

Ferrochromium Briquettes (2# Cont. Cr)

	% Chromium	% Carbon	% Silicon
Standard Exlo	68-73	.025 max.	2.00 max.
Standard Exlo	68-73	.050 max.	2.00 max.
Exlo "75"	75 min.	.015 max.	0.75 max.
Low Carbon 65-5	63-67	.050 max.	4-6
3% Nitrogen Grade	67 approx.	.060 max.	1.00 max.
High Carbon	66-70	4-6	1-2
Charge Grade 58-65	58-65	5.25 max.	3.00 max.
Charge Grade 63-68	63-68	7-8	3-5
Refined Charge Grade	58-65	4.25 max.	1.00 max.
Blocking Grade	55-63	4-6	8-12
Foundry Grade	55-63	4-6	8-12
Ferrochrome Silicon (40-42)	39-42	.05 max.	40-42
Ferrochrome Silicon (36-40)	36 approx.	.05 max.	40 approx.
Ferrochrome Silicon (49-28)	48-52	1.25 max.	25-30
Intermediate Silicon	67-71	.05 max.	0.75-2.00

## COLUMBIUM

Columbium Chromium (65% Cb, 35% Cr)

Columbium Nickel (45-55% Cb, 40-50% Ni)

Columbium Metal (High Purity Grade I)

Columbium Metal (High Purity Grade II)

Ferrocolumbium - Reactor Grade (57-67% Cb)



## COLUMBIUM (Continued)

Ferrocolumbium (62-67% Cb)

Ferrocolumbium 10:1 Ratio (Cb to Ta)

Ferrocolumbium Tantalum (45-55% Cb, Approx. 12% Ta)

Thermocol (Exothermic Approx. 53% Cb)

## DUCTILE IRON ADDITIVES

	% C	% Ni	% Mg	% Si	% Ca	% Ce	% Cu	% Fe
NMA #1	2	82	13-16					
NMSA #2		51	13-16	35				5 Max.
* Calsifer 75				74-79	.5 min			Bal.
* Calsifer 85				80-90	.5 min			Bal.
Noduloy 6C			5½-7½	44-48		.5-.7		
Noduloy 7			8-9½	43-47			4½-6½	Bal.
Noduloy 7C			8-9½	43-47		.5-.7	4½-6½	Bal.
Noduloy 8			8-9½	44-48				Bal.
Noduloy 8C			8-9½	44-48		.5-.7		Bal.
Noduloy 12			10½-13	37-41			15-18	Bal.
Noduloy 18C			18-20	60-65		.5-.7		Bal.
Noduloy 33			33	50				Bal.
Noduloy 40			40	40				Bal.
70-30 Alloy		70	30					

\* Also available with 1½% and 2½% Min. Calcium

## EXOTHERMIC ALLOYS

Thermocol (Approx. 53% Cb)

Thermosil (Approx. 61% Si)

Thermovan (V)

## GRAINAL

#1 (25% V, 15% Ti, 10% Al, 0.20% B)

#79 (20% Ti, 13% Al, 4% Zr, 8% Mn, 5% Si, 0.50% B)

#100 (20% Ti, 13% Al, 4% Zr, 8% Mn, 5% Si, 1% B)

#790 (20% Ti, 13% Al, 4% Zr, 8% Mn, 5% Si)

## GRAPHIDOX

#4 (48-52% Si, 9-11% Ti, 5-7% Ca)

## MANGANESE

Electrolytic Manganese Metal

Tronomang Regular

Tronomang Extra Low-Hy

Tronomang Nitro-4

Tronomang Nitro-6

Tronomang Low-Hy

Briquettes (2% Mn contained)

Ferromanganese (74-76%) Standard High Carbon

## MOLYBDENUM

Molybdenum Chromium (30% Mo, 68% Cr or 70% Mo, 28% Cr)

Molybdenum Aluminum (60% Mo, 40% Al)

Molybdenum Rondelles - Vacuum Melting Grade (99.8% Mo. Min.)

Molybdenum Powder (99.8% Mo Min.)

Molybdenum Tablets (99.8% Mo Min.)

## NICKEL

Nickel Columbium (40-50% Ni, 45-55% Cb)

Nickel Selenium

Nickel Titanium (80% Ni, 20% Ti)

Electrolytic Nickel (99.95% Ni Including Cobalt)

1" QM squares

1" sqs. (about 3/8" thick)

# FOUNDRY PRODUCTS

## NICKEL (Continued)

- 2" sqs. (about 3/8" thick)
- 4" sqs. (about 3/8" thick) about 2½ lbs. each
- 9" sqs. (about 3/8" thick) about 12 lbs. each
- 4½" x 28½" (about 3/8" thick) about 18 lbs. each
- 9" x 28½" (about 3/8" thick) about 36 lbs. each
- 12" x 28½" (about 3/8" thick) about 45 lbs. each
- 38" x 28½" (about 3/8" thick) about 145 lbs. each
- 4" x 8" (about .015" thick)

### Grade XX Shot

1" on .053"

1/2" x 3/16"

3/8" on .053"

Thru .071" High Sulphur Steam Shattered

Thru .053" Low Sulphur Steam Shattered

F. Nickel Shot - 1/4" on 30 mesh

F. Nickel Ingot - 5# size

Nickel Ingot - 10# size

NMA #1 2¼" on ¾" and 1" on 8 mesh

NMSA #2 2¼" on ¾" and 1" on 8 mesh

Nickel Oxide Sinter

Black Nickel Oxide thru ¼"

Green Nickel Oxide thru ¼"

## SELENIUM

Ferro Selenium

Nickel Selenium

## SILICOMANGANESE

Briquettes (½# Si Plus 2# Mn contained)

18-20% Grade Silicon (65-68% Mn) 1½% Max. C

15-17½% Grade Silicon (65-68% Mn) 2% Max. C

12-14½% Grade Silicon (65-68% Mn) 3% Max. C

## SILVERY PIG

12 grades in .50% increments from 13½% to 19¼% and 22% grade  
in 12½# piglets, 30 lb., 45 lb., and 60 lb. pigs.

## SILICON

Briquettes (1# or 2# Si, contained)

Ferrosilicon

50% Regular

50% Low Impurity (.50% Max. Al)

50% with Boron

65% Regular

65% Low Impurity (.50% Max. Al)

75% Regular

75% Low Impurity (.50% Max. Al)

80-90% Regular

80-90% Low Impurity (.50% Max. Al)

90-95% Regular

90-95% Low Impurity (.50% Max. Al)

Thermosil (Exothermic)

Silicon Metal Max. .35% iron

Silicon Metal Max. .50% iron

Silicon Metal Max. 1.00% iron

Silicon Metal Max. 1.50% iron

Lithium Ferrosilicon

Inoculoy 63

# FOUNDRIY PRODUCTS

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## TANTALUM

(99.5-99.9% Guaranteed)

## TITANIUM

Titanium Aluminum (50% Ti grade)  
Titanium Nickel (20% Ti, 80% Ni)  
Titanium Wafers - vacuum melting grade (99.5% Ti Min.)  
Ferrotitanium 70% Grade (66-68% Ti, 3¼%-3¾% Al)  
Low Carbon (.10% max.) Ferro 30% Titanium  
Low Carbon (.10% max.) Ferro 40% Titanium  
Low Carbon (.10% max.) Ferro 27-32% Titanium Grade 1  
(1½% max. Al)  
Low Carbon (.10% max.) Ferro 27-32% Titanium Grade 2  
(2% max. Al)  
Low Carbon (.10% max.) Ferro 27-32% Titanium Grade 3  
(2½% max. Al)

## TUNGSTEN

Tungsten Metal (99.9% W)  
Tungsten Rondelles - Vacuum Melting Grade (99.9% W Min.)  
Tungsten Powder (99.9% Min. W)  
Tungsten Tablets (99.8% Min. W)  
Tungsten Sponge Mix  
Tungsten Chromium (40% W, 60% Cr)

## VANADIUM

Vanadium Aluminum (2½%, 5%, 40%, and 85% V)  
Ferrovanadium

	% Vanadium	% Silicon	% Carbon
Iron Foundry Grade	38-42	7-11	1.00 approx
Open Hearth Grade	50-60	8.0 max.	3.00 max.
Grade "A" Open Hearth	50-55	7.5 max.	2.00 max.
Grade "B" Crucible	55-55	2.25 max.	.50 max.
Grade "B" Crucible	70-80	2.25 max.	.50 max.
Grade "C" Primos	50-55	1.25 max.	.20 max.
Grade "C" Primos	70-80	1.25 max.	.20 max.
Low Silicon Grade	50	1.50 max.	.20 max.
Low Silicon Grade	70	1.50 max.	.20 max.

Thermovan (Exothermic)

Vanadium Metal - 90% V Grade  
Vanadium Metal - 90% V Grade (Low Silicon)  
Vanadium Metal - 99.5% Grade

## V-5 FOUNDRY ALLOY

(38-42% Cr, 17-19% Si, 8-11% Mn)

## ZIRCONIUM

Zirconium Wafers (99.5% Zr Min.)  
Zirconium Aluminum (about 50-50 ratio)



# WELDING & BRAZING

## ALUMINUM WELDING AND BRAZING

Aluminum can be welded and brazed by most of the established processes . . .

### Welding

Metal Arc Welding  
Oxyacetylene Welding  
Inert Gas Welding  
    Metal-inert gas (Mig)  
    Tungsten-inert gas (Tig)

### Brazing

Torch  
Furnace  
Dip Brazing  
Induction Heating

A complete line of Alcoa products used in the above processes are available from stock. In addition, we stock Mig and Tig wires in spooled and straight lengths. These wires are of the highest quality, made possible by non-destructive testing of extruded wire electronically. This testing coupled with the most advanced cleaning process in industry produces a wire superior in electrical properties for welding. Mirror finish surfaces, guaranteed chemical composition of alloy, and layer-level winding, make Whitehead's wires the most completely engineered welding wires available.

## WELDING AND BRAZING ROD — STANDARD COILS

1100, 4043, 5356, 5556, 718, and 716

### Etched or Commercial Finish

Diameter (in inches):  $\frac{1}{4}$ ,  $\frac{3}{16}$ ,  $\frac{5}{32}$ ,  $\frac{1}{8}$ ,  $\frac{3}{32}$ ,  $\frac{1}{16}$

## WELDING ROD — 36" STRAIGHT LENGTHS

4043, 1100, 1260, 5356, 5554, 142\*, 195\*, 355\*, 356\*

Packed in 5 Pound Tubes

Diameter (in inches):  $\frac{1}{4}$ ,  $\frac{3}{16}$ ,  $\frac{5}{32}$ ,  $\frac{1}{8}$ ,  $\frac{3}{32}$ ,  $\frac{1}{16}$

\*Available in  $\frac{1}{4}$ " diameter only

## BRAZING ROD — 36" STRAIGHT LENGTHS

718 and 716

Packed in 5 Pound Tubes

Diameter (in inches):  $\frac{1}{4}$ ,  $\frac{3}{16}$ ,  $\frac{1}{8}$ ,  $\frac{3}{32}$ ,  $\frac{1}{16}$

## ALUMINUM WELDING ELECTRODE

Consumable Electrode for Shielded Inert Gas Metal Arc Welding  
Precleaned and Level Wound on Non-Returnable Spools for All Position Welding

4043, 1100, 2319, 5154, 5356, 5554, 5556

### 12½ Pound Spool

Electrode Diameter:  $\frac{1}{8}$ ,  $\frac{3}{32}$ ,  $\frac{1}{16}$ ,  $\frac{3}{64}$ , .030

### 1 Pound Spool

Electrode Diameter:  $\frac{1}{16}$ ,  $\frac{3}{64}$ , .030

SEAMLESS  
STEEL  
(Conti

MONEL-NICKEL

3/4

FOUNDRY • WELDING  
BRAZING PRODUCTS

# WELDING & BRAZING

## ALUMINUM

### 718 ALUMINUM BRAZING FILLER STOCK

Mill Finish

Thickness (in inches)	Size (in inches)
.010	6 x 24
.015	6 x 24

### #64 ALUMINUM SOLDER FLUX

(For use with #804 Solder)

Size	Packing
5 LB. JAR	4 PER CASE

### 66A AND #67 ALUMINUM SOLDER FLUX

(For use with #805 Solder)

Size	Packing
5 LB. JAR	4 PER CASE
50 LB. DRUM	
150 LB. DRUM	

### #30 ALUMINUM BRAZING FLUX

Size	Packing
5 LB. JAR	4 PER CASE
50 LB. DRUM	
150 LB. DRUM	

### #34 ALUMINUM BRAZING FLUX

Size	Packing
5 LB. JAR	4 PER CASE
50 LB. DRUM	
150 LB. DRUM	

### #804 ALUMINUM SOLDER

Low Temperature  
Melting Range: 338°F-492°F

Diameter (in inches)	Packing
$\frac{1}{8}$	1 LB. SPOOL
$\frac{1}{4}$	36" LENGTHS
$\frac{1}{16}$	1 LB. SPOOL

### #805 ALUMINUM SOLDER

High Temperature  
Melting Range: 715°F-725°F

Diameter (in inches)	Packing
$\frac{1}{16}$	25# COIL OR 36" ST. LGTHS
$\frac{3}{32}$	25# COIL OR 36" ST. LGTHS
$\frac{1}{8}$	25# COIL OR 36" ST. LGTHS

### #22 ALUMINUM WELDING FLUX

Size	Packing
5 LB. JAR	4 PER CASE
50 LB. DRUM	
150 LB. DRUM	

### #33 ALUMINUM BRAZING FLUX

Size	Packing
5 LB. JAR	4 PER CASE
50 LB. DRUM	
150 LB. DRUM	

### #53 ALUMINUM BRAZING FLUX

Size	Packing
5 LB. JAR	4 PER CASE
50 LB. DRUM	
150 LB. DRUM	

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# WELDING & BRAZING

## INCO WELDING MATERIALS

All joining processes used widely for steel are applicable with only slight modification necessary in some cases to Monel, Nickel, Inconel, Incoloy, and Ni-O-Nel. Available on request, the following publications describe the correct welding procedures for achieving the best results:

- T-2 "Fusion Welding of Nickel and High Nickel Alloys"
- T-33 "Resistance Welding of Nickel and High Nickel Alloys"
- T-34 "Brazing and Soldering Nickel and High Nickel Alloys"

Inco's electrodes and wires were developed specifically for welding Inco Nickel Alloys, wrought, cast and clad products. The mechanical properties and corrosion resistance of properly made welds in nickel, Monel and Inconel will be equal to or better than the base material.

## INCO FLUX COATED ELECTRODES

The following flux-coated electrodes are generally stocked in diameters  $\frac{3}{32}$ ",  $\frac{1}{8}$ ",  $\frac{5}{32}$ ",  $\frac{3}{16}$ ", and  $\frac{1}{4}$ ":

Type Number	Recommended For
"130" MONEL ELECTRODE	GENERAL PURPOSE — METAL ARC WELDING OF MONEL, "402" & "403" MONEL AND SOMETIMES "K" MONEL.
"131" NICKEL ELECTRODE	GENERAL PURPOSE — METAL ARC WELDING OF NICKEL AND LOW CARBON NICKEL.
"132" INCONEL ELECTRODE	GENERAL PURPOSE — METAL ARC WELDING OF INCONEL.
"134" "K" MONEL ELECTRODE	SPECIAL PURPOSE — METAL ARC WELDING OF "K" MONEL AND OVERLAYING "K" MONEL ON STEEL.
"135" NI-O-NEL ELECTRODE	SPECIAL PURPOSE — METAL ARC WELDING OF NI-O-NEL.
"139" INCONEL "X" ELECTRODE	SPECIAL PURPOSE — METAL ARC WELDING OF INCONEL "X" AND INCONEL "W".
"140" MONEL ELECTRODE	SPECIAL PURPOSE — METAL ARC WELDING CLAD SIDE OF MONEL-CLAD STEEL, OVERLAYING MONEL ON STEEL, JOINING MONEL TO STEEL.
"141" NICKEL ELECTRODE	SPECIAL PURPOSE — METAL ARC WELDING CLAD SIDE OF NICKEL-CLAD STEEL, OVERLAYING NICKEL ON STEEL AND JOINING NICKEL TO STEEL.
"142" 80/20 NICKEL CHROMIUM ELECTRODE	SPECIAL PURPOSE — METAL ARC WELDING OF THE CLAD SIDE OF INCONEL-CLAD STEEL OR SOMETIMES NICKEL-CLAD STEEL, WELDING 80/20 NICKEL CHROMIUM, JOINING INCONEL TO STEEL.
"180" MONEL ELECTRODE	GENERAL PURPOSE — METAL ARC WELDING OF MONEL "400", "402", "403" OR "404" TO THEMSELVES OR TO EACH OTHER. MAY ALSO BE USED FOR WELDING THESE SAME ALLOYS TO STEEL.
"187" 70/30 COPPER-NICKEL ELECTRODE	SPECIAL PURPOSE — METAL ARC WELDING OF 70/30, 80/20 AND 90/10 CU-NI.

SEAM  
STEEL

(Cont)

MONEL-NICKEL

WELDING  
BRAZING PRODUCTS



## NICKEL & NICKEL ALLOYS

### INCO GAS WELDING ROD AND WIRE

The following gas welding rods and wires are generally stocked 36" long in diameters  $\frac{1}{16}$ ",  $\frac{3}{32}$ ",  $\frac{1}{8}$ ",  $\frac{5}{32}$ ",  $\frac{3}{16}$ ", and  $\frac{1}{4}$ ". Spooled wire is stocked in .035", .045", and .062" diameters.

Type Number	Recommended For
"40" MONEL ROD	GENERAL PURPOSE — GAS WELDING MONEL.
"41" NICKEL ROD	GENERAL PURPOSE — GAS WELDING NICKEL.
"42" INCONEL ROD	GENERAL PURPOSE — GAS WELDING INCONEL AND INCOLOY.
"43" MONEL ROD	SPECIAL PURPOSE — GAS WELDING "402" & "403" MONEL FOR ACID PICKLING SERVICE.
"44" "K" MONEL ROD	GENERAL PURPOSE — GAS WELDING "K" MONEL.
"47" 70/30 COPPER-NICKEL FILLER ROD	SPECIAL PURPOSE — GAS WELDING 70/30, 80/20 AND 90/10 CU-NI.
"60" MONEL ROD AND FILLER WIRE	SPECIAL PURPOSE — INERT GAS METAL ARC WELDING OF MONEL-TUNGSTEN AND CONSUMABLE.
"61" NICKEL ROD AND FILLER WIRE	SPECIAL PURPOSE — INERT GAS METAL ARC WELDING OF NICKEL-TUNGSTEN AND CONSUMABLE.
"62" INCONEL ROD AND FILLER WIRE	SPECIAL PURPOSE — INERT GAS METAL ARC WELDING OF INCONEL- AND INCOLOY-TUNGSTEN AND CONSUMABLE.
"64" "K" MONEL ROD AND FILLER "65" WIRE	SPECIAL PURPOSE — INERT GAS METAL ARC WELDING OF "K" MONEL-TUNGSTEN AND CONSUMABLE.
"65" NI-O-NEL ROD AND FILLER WIRE	SPECIAL PURPOSE — INERT GAS METAL ARC WELDING OF NI-O-NEL TUNGSTEN AND CONSUMABLE.
"67" 70/30 COPPER-NICKEL ROD AND FILLER WIRE	SPECIAL PURPOSE — INERT GAS METAL ARC WELDING OF 70/30, 80/20 AND 90/10 CU-NI.
"69" INCONEL "X" ROD AND FILLER WIRE	SPECIAL PURPOSE — INERT GAS METAL ARC WELDING OF INCONEL "X"-TUNGSTEN AND INCONEL "W"-TUNGSTEN AND CONSUMABLE.

Continued on next page.

# WELDING & BRAZING

## NICKEL & NICKEL ALLOYS

### INCO GAS WELDING ROD AND WIRE (Continued)

"82" INCONEL ROD AND FILLER WIRE	SPECIAL PURPOSE — INERT GAS WELDING OF INCONEL ALLOY "600" TO ITSELF OR TO STAINLESS OR CARBON STEELS, ALSO FOR OVERLAYING ON STEEL.
INCONEL "92" ROD AND FILLER WIRE, FORMER- LY INCO-WELD "A" WIRE	GENERAL PURPOSE — INERT GAS METAL ARC WELDING DISSIMILAR ALLOYS AS: AUSTENITIC AND FERRITIC TO EACH OTHER AND TO HIGH-NICKEL ALLOYS; ALSO FOR WELDING INCOLOY.

### INCO WELDING FLUXES

Type Number	Recommended For
INCO "1" FLUX	SPECIAL PURPOSE — FLUX FOR GAS WELD- ING COPPER ALLOYS AND FOR HARD FACING "K" MONEL.
INCO "2" FLUX	GENERAL PURPOSE — GAS WELDING AND BRAZING OF INCONEL, STAINLESS STEELS AND OTHER CHROMIUM CONTAINING ALLOYS. — BACKING FLUX FOR INERT GAS METAL ARC WELDING.
INCO "3" FLUX	GENERAL PURPOSE — GAS WELDING AND BRAZING OF MONEL AND OTHER NICKEL- COPPER ALLOYS. — BACKING FLUX FOR INERT GAS METAL ARC WELDING.

# WELDING & BRAZING

## NICKEL & NICKEL ALLOYS

### NI ROD AND NI-ROD "55" WELDING ELECTRODES

Flux Coated

Ni-Rod is used in the metal arc welding of cast iron, joining cast iron to steel, and in joining the ferrous alloys, nickel alloys and some copper alloys. It gives strong, sound, machinable cast iron welds, and is known for its thorough fusion, fine wash, excellent bead contour, and easily removable slag. It seldom requires pre-heat and post-heat, and provides a stable arc in all positions.

Ni-Rod "55" similarly is used in the metal arc welding of cast iron, ductile iron, and Ni-Resist. This rod is particularly useful for heavy sections and high phosphorous irons.

These electrodes are stocked in  $\frac{3}{32}$ ",  $\frac{1}{8}$ ",  $\frac{5}{32}$ ", and  $\frac{3}{16}$ ". They can be used with either AC or DC. Descriptive literature is available on request.

NOTE: All coated electrodes on the market are hygroscopic to some degree. Under conditions of high humidity or prolonged storage, it is well to provide additional protection in the form of ovens or drying agents.

### INCO-WELD "A" WELDING ELECTRODES

Flux Coated

Inco-Weld "A" is a versatile electrode for use in joining dissimilar metals. In such applications, it gives sound, high quality welds in better than 90% of the cases normally encountered in the fabricating shop. This rod permits production of X-ray quality welds which in most cases is equivalent to or better than either of the alloys being welded. Inco Rod "A" is used successfully in such typical combinations as mild steel and Type 304 stainless, mild steel and Type 347 stainless, Monel and Type 410 stainless, Inconel and Type 405 stainless, and numerous others. It is used on D.C. (Reversed Polarity). A descriptive folder is available on request. The stocked sizes with the recommended amperage ranges are as follows:

Diameter (in inches)	Amps
$\frac{3}{32}$	40-65
$\frac{1}{8}$	75-100
$\frac{5}{32}$	90-130
$\frac{3}{16}$	110-150

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# WELDING & BRAZING

## STAINLESS STEEL WELDING ELECTRODES

Whitehead Rezistal® Stainless Steel Welding Electrodes are available in two basic coatings — DC Lime and AC-DC Titania coatings. Excellent starting characteristics are obtained on all types of AC welding equipment with Whitehead AC-DC stainless electrodes. Arc is stable, smooth, with fine spray weld metal transfer and bead in uniform, flat or slightly concave with straightline feathered edges. Complete penetration and freedom from porosity is assured. Slag is easily and completely removed without secondary film, which means less cleaning, grinding and polishing time. Weld has corrosion resistance equal to that of parent metal with excellent mechanical properties.

Rezistal Grade	AWS-ASTM Classification Number	Typical Weld Deposit Analysis
TYPE 308	E308	CARBON .07% MAX. CHROMIUM 19.0% NICKEL 9.5%
TYPE 308ELC	E308L	CARBON .04% MAX. CHROMIUM 19.0% NICKEL 9.5%
TYPE 309	E309	CARBON .10% MAX. CHROMIUM 23.0% NICKEL 13.0%
TYPE 309CB	E309CB	CARBON .10% MAX. CHROMIUM 23.0% NICKEL 13.0% COLUMBIUM .80%
TYPE 310	E310	CARBON .20% MAX. CHROMIUM 26.0% NICKEL 21.0%
TYPE 310CB	E310CB	CARBON .12% MAX. CHROMIUM 26.0% NICKEL 21.0% COLUMBIUM .80%
TYPE 310MO	E310MO	CARBON .12% MAX. CHROMIUM 26.0% NICKEL 21.0% MOLYBDENUM 2.0%
TYPE 312	E312	CARBON .15% MAX. CHROMIUM 29.0% NICKEL 9.5%
TYPE 316	E316	CARBON .07% MAX. CHROMIUM 18.0% NICKEL 13.0% MOLYBDENUM 2.25%
TYPE 316ELC	E316L	CARBON .04% MAX. CHROMIUM 18.0% NICKEL 13.0% MOLYBDENUM 2.25%
TYPE 317	E317	CARBON .07% MAX. CHROMIUM 19.0% NICKEL 13.0% MOLYBDENUM 3.50%
TYPE 318	E318	CARBON .07% MAX. CHROMIUM 18.0% NICKEL 12.0% MOLYBDENUM 2.25% COLUMBIUM .80%
TYPE 330	E330	CARBON .25% MAX. CHROMIUM 15.0% NICKEL 35.0%
TYPE 347	E347	CARBON .07% MAX. CHROMIUM 19.0% NICKEL 9.5% COLUMBIUM .80%

Whitehead Rezistal Stainless Steel Welding Electrodes are stocked in diameters  $\frac{1}{4}$ ",  $\frac{3}{16}$ ",  $\frac{5}{32}$ ",  $\frac{1}{8}$ ",  $\frac{3}{32}$ ",  $\frac{9}{64}$ " and  $\frac{1}{16}$ ".

®Trade Mark Crucible Steel Company

# WELDING & BRAZING

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## STAINLESS STEEL WELDING WIRE

Whitehead's Rezistal® stainless steel welding wires and rods are manufactured under a carefully administered, high standard quality control program. Modern equipment designed especially for welding wire production, assures that every form of Whitehead's wire has the characteristics best suited for the process by which it is applied. Temper, cast, helix and surface finish are closely controlled as the chemistry and properties of the wire. Whitehead's Rezistal Gas, Mig, Tig and Submerged arc welding wires conform to government and association specifications and codes.

®Trademark of Crucible Steel Company

## STAINLESS STEEL WELDING WIRE

Rezistal Grade	Typical Chemical Analysis			
TYPE 308	CARBON MANGANESE CHROMIUM	0.08% MAX. 1.75% 20.50%	NICKEL SILICON	9.75% 0.40%
TYPE 308ELC	CARBON MANGANESE CHROMIUM	0.03% MAX. 1.75% 20.50%	NICKEL SILICON	9.75% 0.40%
TYPE 309	CARBON MANGANESE CHROMIUM	0.10% MAX. 1.75% 24.25%	NICKEL SILICON	13.50% 0.40%
TYPE 310	CARBON MANGANESE CHROMIUM	0.15% MAX. 1.75% 26.50%	NICKEL SILICON	21.50% 0.40%
TYPE 312	CARBON MANGANESE CHROMIUM	0.10% MAX. 1.75% 30.00%	NICKEL SILICON	8.75% 0.40%
TYPE 316	CARBON MANGANESE CHROMIUM	0.08% MAX. 1.75% 19.00%	NICKEL SILICON MOLYBDENUM	13.25% 0.40% 2.20%
TYPE 316ELC	CARBON MANGANESE CHROMIUM	0.03% MAX. 1.75% 19.00%	NICKEL SILICON MOLYBDENUM	13.25% 0.40% 2.20%
TYPE 347	CARBON MANGANESE CHROMIUM NICKEL	0.08% MAX. 1.75% 20.00% 9.75%	SILICON COLUMBIUM PLUS TANTALUM	0.40% 0.80%
TYPE 348	CARBON MANGANESE CHROMIUM NICKEL	0.08% MAX. 1.75% 20.00% 9.75%	SILICON COLUMBIUM TANTALUM 0.10% MAX.	0.40% 0.80%
TYPE 349	CARBON MANGANESE CHROMIUM NICKEL	0.12% MAX. 1.75% 20.00% 8.50%	SILICON MOLYBDENUM COLUMBIUM TUNGSTEN	0.40% 0.50% 1.25% 1.50%
TYPE 410	CARBON MANGANESE CHROMIUM	0.12% MAX. 0.40% 12.50%	NICKEL SILICON	— 0.35%
TYPE 430	CARBON MANGANESE	0.10% MAX. 0.40%	CHROMIUM SILICON	16.50% 0.35%

®Trade Mark Crucible Steel Company

Whitehead Rezistal Stainless Steel Welding Wires are stocked in 36" lengths — in diameters  $\frac{1}{16}$ ",  $\frac{3}{32}$ ",  $\frac{1}{8}$ ",  $\frac{5}{32}$ " and  $\frac{3}{16}$ ". Spooled wire is available in .035", .045" and .062" diameters.

# WELDING & BRAZING

## COPPER ALLOYS

Specifying an Anaconda American welding or brazing rod assures consistent high quality performance. Anaconda products are used for welding both deoxidized and electrolytic copper in wrought and cast form. They are also used with silicon copper alloys such as Everdur. These wires and rods are widely used in the welding and surfacing of steel.

### ANACONDA COPPER 189 WELDING ROD

Diameter (in inches)	Length (in inches)
$\frac{3}{32}$	36
$\frac{1}{8}$	36
$\frac{5}{32}$	36
$\frac{3}{16}$	36
$\frac{1}{4}$	36

### EVERDUR 658 WELDING ROD

Diameter (in inches)	Length (in inches)
$\frac{1}{16}$	36
$\frac{3}{32}$	36
$\frac{1}{8}$	36
$\frac{5}{32}$	36
$\frac{3}{16}$	36
$\frac{1}{4}$	36

### TOBIN BRONZE 470 WELDING ROD

Diameter (in inches)	Length (in inches)
$\frac{1}{8}$	36
$\frac{5}{32}$	36
$\frac{3}{16}$	36
$\frac{1}{4}$	36

### ANACONDA 681 WELDING ROD\*

Diameter (in inches)	Length (in inches)
$\frac{1}{16}$	36
$\frac{3}{32}$	36
$\frac{1}{8}$	36
$\frac{5}{32}$	36
$\frac{3}{16}$	36
$\frac{1}{4}$	36

\*Low Fuming

### PHOSPHOR BRONZE 510 and 524

Diameter (in inches)	Length (in inches)
$\frac{1}{16}$	36
$\frac{3}{32}$	36
$\frac{1}{8}$	36
$\frac{5}{32}$	36
$\frac{3}{16}$	36
$\frac{1}{4}$	36

### NICKEL SILVER 773 WELDING ROD

Diameter (in inches)	Length (in inches)
$\frac{1}{16}$	36
$\frac{3}{32}$	36
$\frac{1}{8}$	36
$\frac{3}{16}$	36
$\frac{1}{4}$	36



# WELDING & BRAZING

INDUSTRIAL PRODUCTS

## SILVER BRAZING ALLOYS

Handy & Harman

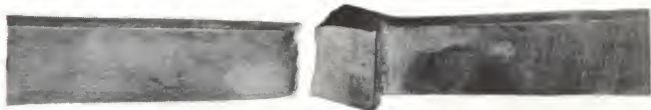
Easy-Flo Brazing Alloys, Sil-Fos Brazing Alloys and Handy Fluxes products of Handy & Harman, are stocked at all of our warehouses. They are low temperature silver brazing alloys which produce high strength joints and offer many other advantages.

Sil-Fos contains 15% silver and flows freely at 1300° F. It joins non-ferrous metals only — used particularly on copper, brass, and bronze. It is especially effective for joining pipe and tubing, and is widely used on electrical work. Easy-Flo (original alloy) contains 50% silver and flows freely at 1175° F. It joins ferrous and non-ferrous metals, including iron, steel, stainless steel, copper-nickel and chrome-nickel alloys. It is especially effective for joining dissimilar metals.

Easy-Flo 3 is similar to Easy-Flo, also containing 50% silver, but varies slightly in composition and flowing characteristics. It flows freely at 1270°F. Easy-Flo 3 is widely used for brazing cemented carbide tool tips to shanks, for fabricating large copper piping, for applications involving wide tolerances, and where filtering is required.

Easy-Flo 3 Trimetal is an Easy-Flo 3 Coating on each side of a copper shim, in a 50/50 ratio of alloy and copper. Its flow point is 1270°F. Easy-Flo 3 Trimetal is especially suited for applications requiring a "sandwich" type braze, such as big lathe, planer and shaper tools, milling and form cutters, breaches, etc. By preplacing the alloy and copper all in one piece instead of three, much time and labor are saved.

Easy-Flo 45 contains 45% silver and flows freely at 1145° F., the lowest working temperature of any alloy capable of making high strength joints. It joins all ferrous, non-ferrous, and dissimilar metals that melt at temperatures above the working temperature of the alloy. It is extremely fluid at its working temperature,



### STRENGTH

Tensile tests prove that properly made Sil-Fos, Easy-Flo, and Easy-Flo 3 brazed joints are stronger than the metals joined.

### DUCTILITY

Bend, twist, hammer Sil-Fos, Easy-Flo, or Easy-Flo 3 joints — the silver content gives them the ductility to take it.



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## SILVER BRAZING ALLOYS (Continued)

Handy & Harman

assuring deep penetration and outstanding other alloys two to one. The lower silver content, lower flow point, large covering capacity, fast action and small amount of alloy needed all combine to make possible fast production of strong, liquid and gas-tight joints at new low metal joining costs. In addition, its lower working temperature means increased protection to the metal against warpage and heat damage.

Easy-Flo 35 contains 35% silver and flows freely at 1295° F., the lowest flow point for an alloy having this silver content. It joins all ferrous, non-ferrous and dissimilar metals that melt at temperatures above the working temperature of the alloy. It flows freely at its working temperature and penetrates rapidly, making high strength joints with thin films. The flow point and silver content have been carefully balanced in this alloy. The result is an alloy that brings worthwhile economies to many metal joining jobs — especially those which can be done with a torch and where a temperature of 1295° F. is not objectionable.

Because Sil-Fos, Easy-Flo, Easy-Flo 3, Easy-Flo 3 Tri-metal, Easy-Flo 45, and Easy-Flo 35 contain silver and are extremely fluid at low working temperatures they:

- 1 Reach brazing temperature quickly.
- 2 Penetrate in a flash to every part of a properly fluxed joint.
- 3 Diffuse into metal surfaces and actually alloy with them.
- 4 Require only thin films to make the strongest joints.
- 5 Leave little or no alloy outside a joint, reducing or eliminating finishing.

Because of their complete penetration, alloying action and the thin films required, Sil-Fos and Easy-Flo brazed joints are:



### LEAK-TIGHTNESS

Pressure tests prove Sil-Fos, Easy-Flo and Easy-Flo 3 joints are leak-tight. Full penetration and alloying action are the reason.



### LOW COST

Thin films make the best joints. Savings in labor, machine work, heating and finishing time combine to give real economy.

# WELDING & BRAZING

## SILVER BRAZING ALLOYS (Continued)

Handy & Harman

- 1 Consistently stronger than the metals joined.
- 2 Liquid and gas-tight.
- 3 Ductile — stand up under vibration, shocks and temperature changes.
- 4 Permanently high in electrical conductivity — they can't loosen up or corrode internally.
- 5 Resistant to a great many corrosive agents.
- 6 As good or better than the metals joined in heat conductivity.

In addition to those described, there are many other alloys and fluxes available for special applications. For information, call our nearest warehouse sales office, or write for Handy & Harman Bulletin 20.

### SILVER CONTENTS AND FLOW POINTS IN DEGREES F.

Brazing Alloys	Silver Content	Melting Point °F	Flow Point °F
EASY-FLO	50	1160	1175
EASY-FLO 3	50	1170	1270
EASY-FLO 45	45	1125	1145
EASY-FLO 35	35	1125	1295
SIL-FOS	15	1185	1300
SIL-FOS	5	1185	1300
BRAZE TL	9	1410	1565
BRAZE ATT	20	1140	1500
BRAZE 202	20	1315	1500
BRAZE SS	40	1220	1435
BRAZE 404	40	1220	1580
BRAZE DE	45	1225	1370
BRAZE ETX	50	1250	1425
BRAZE 541	54	1340	1575
BRAZE 560	56	1145	1205
BRAZE 580	57.5	1120	1345
BRAZE 603	60	1115	1225
BRAZE 630	63	1275	1475
BRAZE EASY	65	1240	1325
BRAZE MEDIUM	70	1275	1360
BRAZE BT	72	1435	1435
BRAZE HARD	75	1365	1450
BRAZE IT	80	1340	1490
LITHOBRAZE 846	84.6	1415	1610
LITHOBRAZE 925	92.5	1400	1635
TEC*	5	640	740
TEC-Z*	5	480	600
FOS-FLO	0	1310	1460

\*A solder-not a brazing alloy

INDUSTRIAL PRODUCTS

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# WELDING & BRAZING

## LITHOBRAZE BT LITHOBRAZE 846 LITHOBRAZE 925

For brazing honeycomb  
airframe structures

The Lithobrazes — BT, 846 and 925 — are special purpose alloys formulated for fluxless atmosphere furnace brazing of stainless steels. They are being widely used for brazing honeycomb airframe structures made of PH15-7 Mo and 17-7PH type stainless steels. The addition of lithium to the silver-copper alloys acts as the wetting agent and renders these alloys self-fluxing when used in a hydrogen or inert atmosphere of low dew point (-70°F). Argon is the most commonly used inert gas. These Lithobrazes permit taking advantage of the maximum strength afforded by free node flow.

The use of endogas or exogas atmospheres or standard fluxes is not recommended since they react with the lithium, and interfere with bonding. A minimum brazing temperature of 50°F above the flow point is suggested for atmosphere furnace brazing. These alloys are particularly adaptable to brazing thin sections because solution of the base metal by the filler metal is virtually nil.

Joints made with the Lithobrazes are suitable for application where operating temperatures may be intermittently as high as 900°F. Joints made on heat resistant alloys with these filler metals are not subject to interface corrosion.

## SIL-FOS & SIL-FOS 5

Sil-Fos is a low temperature brazing alloy containing silver, phosphorous and copper. It flows freely at 1300°F., makes joints between copper, brass and bronze that are stronger than the metals joined. Sil-Fos is sold by the pound at remarkably low cost for an alloy containing silver. Sil-Fos 5 is designed for applications in which the brazing alloy need not contain more than 5% silver. It is economical, and makes exceptionally strong joints. Sil-Fos 5 is available in wire and rod only.

Standard Size	Inches per Avoir. Lb.	Standard Size	Inches per Avoir. Lb.
1/8" SQUARE X 36"	210	3/32" WIRE—COILS	475
.050" X 1/8" X 20"	524	1/16" WIRE—COILS	1082
.050" X 1/16" X 20"	1048	3/64" WIRE—COILS	1900
		1/32" WIRE—COILS	4328

## FOS-FLO

Round-Edge, Square Rods

Fos-Flo is a low-temperature, easy-flowing brazing alloy for making strong, leak-proof, corrosion-resistant, self-fluxing joints. It enables material and labor costs to be held to a minimum. Fos-Flo is recommended for use in making all types of joints between copper, bronze, nickel-silver, brass, and other non-ferrous metals — especially medium and heavy-weight parts.

## HANDY FLUX

Handy Flux is a general purpose flux essential to best results with silver brazing alloys for two reasons:

- 1 It works at a temperature low enough to give the full benefit of the low flow point of these alloys. It starts dissolving oxides at 600°F. — 800°F., and at 1100°F. is entirely liquid and active, dissolving completely all refractory oxides.
- 2 From the standpoint of performing other flux functions there is no better flux made than Handy Flux. It speeds up brazing action. It is an excellent cleaning agent. It washes off readily in hot water after brazing. Its paste form makes it easy to apply with a brush exactly where it is wanted.

Handy-Flux is stocked at all warehouses in ½-pound, 1-pound, 5-pound jars, and 25-pound and 50-pound metal drums.

Although Handy Flux is the best flux for nearly every metal, under certain conditions special-purpose fluxes are recommended. Such fluxes include:

Handy Flux Type B-1—for brazing high chromium stainless steels, tungsten and chromium carbides and molybdenum alloys.

Handy Flux Type A-1—for brazing aluminum-bronze and other alloys containing small amounts of aluminum and titanium.

Handy Hi-Temp Flux—used where brazing temperatures go into the 1700 to 2000°F range for considerable lengths of time.

For information on Handy Flux or these special purpose fluxes call our nearest warehouse sales office.

## RINGS, SHIMS AND SPECIAL SHAPES

### For Preplacement Brazing

Preplacing the alloy enables you to achieve maximum speed and realize greater economy in Easy-Flo and Sil-Fos brazing. Preplacing gives accurate control of the amount of alloy used per joint, assures a uniform flow of alloy through the joint area, eliminates hand feeding of the alloy — plus offering other advantages.

Easy-Flo and Sil-Fos may be preplaced in any of the following forms:

- 1 Inserts of shim or thin sheet stock cut or stamped to fit joint area.
- 2 Flat washers or disks.
- 3 Rings, or pieces of wire bent to shape.
- 4 Coined washers stamped from wire rings.
- 5 Filings or powder sprinkled on joint surfaces or mixed with flux.
- 6 Alloy sprayed on joint surfaces.
- 7 Surface "tinned" with alloy by dipping or other methods.

To get the complete story on how preplacement may help you, call our nearest warehouse sales office.



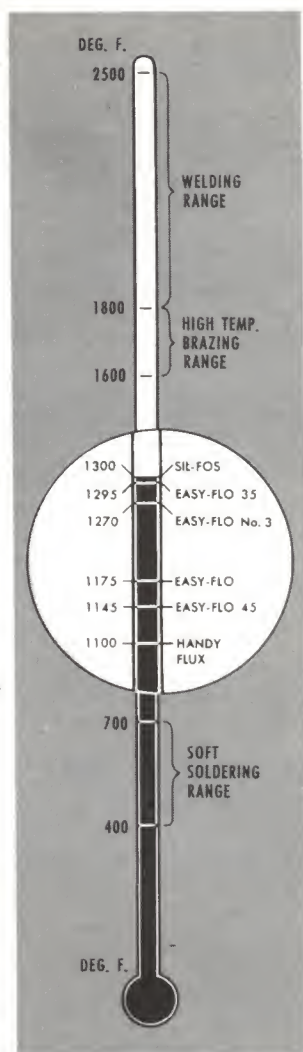
# WELDING & BRAZING

## EASY-FLO

Standard Size	Inches per Troy Ounce†
3/32" WIRE (COILS)	29
1/16" WIRE (COILS)	66
3/64" WIRE (COILS)	116
1/32" WIRE (COILS)	264
*.020" STRIP (COILS)	10
*.010" STRIP (COILS)	20
*.005" STRIP (COILS)	40
*.003" STRIP (COILS)	67

## EASY-FLO 45 & EASY-FLO 35

Standard Size	Inches per Troy Ounce†
3/32" WIRE (COILS)	30
1/16" WIRE (COILS)	68
3/64" WIRE (COILS)	120
1/32" WIRE (COILS)	272
*.020" STRIP (COILS)	10
*.010" STRIP (COILS)	21
*.005" STRIP (COILS)	41
*.003" STRIP (COILS)	69



\*In widths of 1/4" or more.

†A troy ounce is about 10% heavier than an avoirdupois ounce — that is, one troy ounce equals 1.097 avoirdupois ounces. One avoirdupois pound equals 14.583 troy ounces.

**Easy-Flo 3:** A special purpose alloy available in the same forms as Easy-Flo, also in octagonal wire for shipyards.

**Special Sizes:** Standard gauges meet most requirements, but any reasonable gauge wire or strip can be supplied. Also available in: Fine filings and powders from 20 to 200 mesh, washers or rings to specifications. Wire and Strip in special cut lengths.





## WHAT DO YOU NEED IN

# INDUSTRIAL PRODUCTS

Hundreds of metal accessories are available from stock and are supplied by many of the nation's leading mills.

This section of the Metalog lists many of these.

A separate catalog is available on fastenings. Get your copy by sending in the handy request form on the next page.

For additional literature, see the following page. For additional information on any metal accessory, call our nearest warehouse sales office.

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# INDUSTRIAL PRODUCTS

Stocks change from time to time. If the material you want is not listed here, call or write our office nearest you for additional information.

## LITERATURE ON INDUSTRIAL PRODUCTS

Many mill suppliers publish hundreds of free booklets on their products. Just a few of these are listed below. To get literature, call or write our nearest office.

### Valve Catalogs

Harper Computer of Corrosion Resistance

Nu-Rail & Speed-Rail Slip-On Fittings

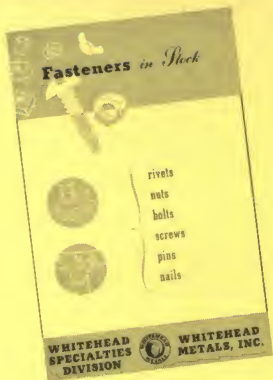
Parker Tube Fitting Catalog

Parker Tube Fitters Manual

Flowline — Stainless Steel & Aluminum Welding Fittings and Flanges

## TELEPHONES OF OFFICES AND WAREHOUSES:

New York, New York  
 .....WOrth 4-2800  
 Carteret, N. J. . . . YOrktown 9-2000  
 Cambridge, Mass.  
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 Harrison, N. J. . . . HUmboldt 5-5900  
 Philadelphia, Pa. . . . BAldwin 9-2323  
 Baltimore, Md. . . . WIndsor 4-2000  
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## FASTENERS *in Stock*

Whitehead Metals stocks hundreds of industrial fasteners in a wide variety of shapes, sizes and alloys . . . too numerous to list in this Metalog.

A complete, easy-to-use catalog containing all the necessary information on bolts, screws, nuts, washers, rivets and others, is available to you without charge.

To receive your FREE copy, fill in and mail the postpaid reply card below.

Gentlemen:

Please send me a free copy of your fastenings catalog, "FASTENERS in Stock".

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Title \_\_\_\_\_

Company \_\_\_\_\_

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A Corporate Division of Metal Goods Corporation

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INDUSTRIAL PRODUCTS

MONEL-NICKEL

FOUNDRY • WELDING  
BRAZING PRODUCTS

STAINLESS STEEL

BRASS

COPPER

# INDUSTRIAL PRODUCTS

## FASTENINGS

Aluminum, Brass,  
Copper, Bronze, Monel, Nickel,  
Inconel, Stainless Steel, Nylon

The mechanical fastenings, listed below, have proved their durability and dependability under the most severe service conditions. When used within the scope of their mechanical and chemical limitations, you can have complete confidence in their performance. Complete details on all sizes and types are available

**Bolts** — Machine Bolts, Stove Bolts, Square Neck Carriage Bolts, Oval Neck Connector Bolts, Hanger Bolts

**Screws** — Machine Screws, Cap Screws, Knurled Brass Screws, Wood Screws, Set Screws, Self-Tapping Screws, Lag Screws (Lag Bolts), Thumb Screws

**Nuts** — Machine Screw Nuts, Cap Nuts, Wing Nuts, Hexagon Nuts, Castellated Nuts, Knurled Brass Nuts

**Washers** — Flat Washers, Countersunk Finishing Washers, Lock Washers

**Rivets** — Rivets, Flat Head Tinnings' Rivets

**Threaded Brass Rod**

**Cotter Pins**

**Escutcheon Pins**

**Nails** — Aluminum Nails, Copper Wire Nails (Diamond Point), Flathead (Monel Wire Nails), Flathead "Anchorfast" (Monel Boat Nails)

## TUBE FITTINGS AND FABRICATING TOOLS

37° Flare  
Non-Flare "Bite"  
Flareless Grip  
Adapters  
Welding, Brazing  
Tools

Tubing systems joined by Parker fittings incorporate many advantages for lines carrying liquids or gases. Because most tubing has relatively thin walls with high strength values, it is light in weight, compact, and can be readily formed to the contours of machines and equipment. With Parker fittings, fabrication is clean, joints are tight, and maintenance is simple.

Parker fittings are manufactured to exacting specifications for different applications. Catalogs, technical data and additional information are available from our nearest warehouse sales office.

When ordering tube fittings, always give the complete part number which includes designations of size, shape and type, and materials. Ordering information is provided in every Parker tube fittings catalog. Get your FREE copy from us, today.

The following tube fittings are available:

Triple-lok 3-piece Flare Tube Fittings  
Ferulok Flareless Tube Fittings  
Intru-lok Flareless Tube Fittings  
Ridg-lok Compression Tube Fittings  
Adapter Fittings  
Weld-lok Socket Type Tube Fittings  
Braze-lok Socket Type Tube Fittings  
Hoze-lok Fittings and Hose

## FABRICATING TOOLS

Tube Cutters  
Flaring Tools  
Tube Benders

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# INDUSTRIAL PRODUCTS

## PIPE FITTINGS

Screwed Pipe Fittings  
Socket Weld Pipe Fittings  
Flange Pipe Fittings  
Flanges  
Rack and Handrail Fittings

Pipe, rack and handrail fittings are selected and stocked by us to meet your most exacting requirements. High quality materials and workmanship plus superior engineering performance guide us in our choice and assure you of receiving dependable performance in all your piping jobs.

Catalogs and technical literature are yours free of charge. For more information, call or write our office nearest you.

## WELDING FITTINGS

### FLOWLINE FITTINGS

Aluminum,  
Stainless Steel,  
Monel, Nickel

An extensive line of Flowline weld fittings are carried in stock for you. These quality fittings are cold formed by an exclusive Flowline Corporation process which produces a smooth, corrosion-resisting surface. Castings are not used in the manufacture of Flowline fittings; they are made from forged or wrought alloys to eliminate porosity. Ends are machined, not ground, to prevent grit inclusions, which are sources of welding troubles.

90° Elbows  
45° Elbows  
180° Returns  
45° Laterals  
Stub Ends

Straight and Reducing Outlet Crosses  
Concentric and Eccentric Reducers  
Caps  
Straight and Reducing Outlet Tees  
Flanges

Our representatives are well qualified to assist you in solving your corrosion-resistant piping and fitting problems. Call or write for information.

## VALVES

Aluminum  
Stainless Steel  
Monel, Nickel  
Plastic

The valves stocked by our warehouses are selected for their superiority in engineering design . . . the high quality of their materials . . . and the precision with which they have been machined.

No matter what your control problem may be, it can be solved with one or more of the many types of valves offered.

Remember that no one alloy or series of alloys can be safely specified unless the exact working conditions have been given careful consideration.

If you want assistance with your specific valve or piping problems, make a date with our representative.

Some of the valves supplied are listed below.

Ball, Gate, Globe and Angle, "Y", Check, Drain Cocks, Needle, Plug, Relief, Two-way, Three-way, Shut-Off, Globe Needle, Angle, Pet Cocks.



# INDUSTRIAL PRODUCTS

## THREAD LUBRICANTS\*

### PARKER THREAD SEALERS AND VALVE LUBES

Item	Application	Packaging
UNIPAR	GENERAL-PURPOSE ANTI-SIEZE AND SEALING COMPOUND	½ PINT CAN
SEALUBE	ANTI-SIEZE FOR FUEL OR OIL SYSTEM PARTS OF ALUMINUM	1 POUND CAN
THREADLUBE	ANTI-SIEZE FOR ALUMINUM, BRASS AND STEEL THREADS	1 POUND CAN
FERULUBE	TO PREVENT GALLING OF THREADED PARTS, AND EASE WRENCH TORQUE	½ POUND TUBE 1 POUND CAN
FUELUBE	VALVE LUBRICANT FOR OIL OR GASOLINE SERVICE	1 POUND CAN

\*Alcoa Thread Lubricant — Stocked in 8 oz. Jars

## WIRE ROPE

### Non-Corrosive Wire Ropes

These wire ropes are manufactured in several sizes and constructions to meet varied service requirements. They are used a great deal for operating, hoisting, and control ropes in the marine, canning, textile, refining and chemical industries.

Non-Corrosive wire ropes give longer, safer service where corrosion would destroy standard carbon steel rope. There are Stainless Steel, Monel, and Phosphor Bronze ropes.

Please get in touch with our office for recommendations and prices

## INDUSTRIAL WIRE CLOTH

### SPECIFICATIONS

A complete line of industrial wire cloth in all standard sizes of mesh and in all common weaves. Special sizes and weaves available. Wire cloth up to 200 mesh is supplied in standard 100-foot lengths, in widths of 24", 30", 36", 42" and 48". Special cut lengths and widths supplied from mill to specification.

### METALS AND ALLOYS

Industrial wire cloth is available in Aluminum, Brass and Copper, Phosphor Bronze, Monel, Nickel, Inconel, Nickel-Chromium, Stainless Steel, Iron and Galvanized, Tungsten, Molybdenum and special alloys.

## GRIPPER SLINGS

Gripper Slings are made from woven wire, and are available in three standard specifications for heavy duty, general use, or light duty. Any metal or alloy may be used in the manufacture of Gripper Slings and are available on special order. Monel or stainless steels are recommended if corrosion or heat conditions are to be encountered. Special Neoprene and Clear PVC plastic covered Gripper Slings are also available for extreme delicate handling of smooth or polished loads.

All Gripper Sling handles are heat treated for extra strength, and each set can be rigged in either a basket or choke hitch.

Gripper Slings have unlimited uses in general material handling, or as a production tool in processing or assembly jobs. Use them with any crane, portable or stationary hoist.

Call our office nearest your for additional information, prices and delivery.

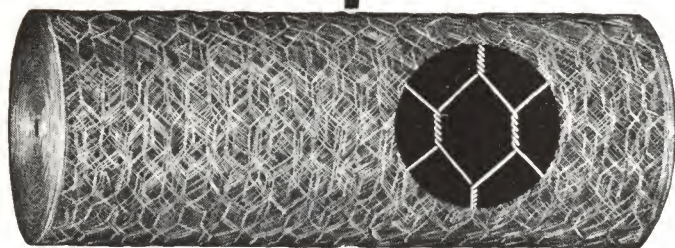
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# INDUSTRIAL PRODUCTS



## INSULATION NETTING

Monel and Stainless Steel

This insulation netting comes in standard rolls of 48" x 300', covering 1200 square feet. Its packaged weight is approximately 86 pounds. The wire is .028" diameter, in 1" Hex netting. It is also available from the mill in cut lengths.

## METALLIC CAULKING COMPOUND

Alumilastic

Alumilastic is an aluminum-base, elastic compound designed for sealing any joint or connection that must be made absolutely water-tight and weatherproof. It is widely used in the Automotive, Railroad and Car Building, Marine, Aircraft and Building Industries.

Alumilastic is available in 7 standard consistencies, ranging from brushing to putty, and is packaged as follows:

### Containers

### Standard Packaging

50/55 gal. drums	
5 gal. pails	
1 gal. can.....	4 per case
1/4 gal. can.....	18 per case
1/8 gal. can.....	32 per case
1/16 gal. can.....	60 per case

### Cartridges

### Collapsible Aluminum Tubes

2" x 8 1/2" Plastic Spouted.....	14 1/2 oz.
2" x 8" Plain Unspouted.....	6 oz.
2" x 10" Plain Unspouted.....	3 1/4 oz.

Cartridges are available in "C" Consistency only. PLAIN CARTRIDGES are used with standard barrel-type caulking guns, SPOUTED CARTRIDGES with cradle-type guns. When cartridges are required, please do not order tubes.

For information concerning your specific application, call our nearest warehouse sales office.

# INDUSTRIAL PRODUCTS

## SHIM STOCK

Laminated Shim Co., Inc.  
Brass and Steel Shim Stock  
6" x 100" Rolls in Cartons

Thickness (in inches)	Pounds per Roll		Thickness (in inches)	Pounds per Roll	
	Brass	Steel		Brass	Steel
.001	.35	.35	.006	1.32	1.21
.0015	.46	.46	.007	1.53	1.40
.002	.54	.54	.008	1.69	1.58
.003	.73	.73	.009	1.89	1.79
.004	.93	.88	.010	2.25	2.18
.005	1.11	1.07			

## SHIM STOCK

Brass and Steel Shim Stock  
Two, 6" x 25" Sheets  
Flat in Envelopes

Thickness (in inches)	Pounds in Envelope	
	Brass	Steel
.012	1.3	1.2
.015	1.7	1.3
.020	1.9	1.8
.025	2.4	2.2
.032	3.0	2.8

## OTHER SHIM STOCK

Shim Stock, in .002 and .003 Laminated Brass, is available in overall thicknesses from .006" to  $\frac{1}{8}$ ", in flat sheets in sizes 8" x 8", 8" x 12", 8" x 24", 8" x 36", 8" x 48". In addition, kits are available that contain several rolls of shim stock in various thicknesses. Call our nearest warehouse sales office for additional information.

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## CLAD STEEL PLATES

**Nickel, Inconel, and  
Monel-Clad Steels  
Stainless-Clad Steels  
Economy in Heavy Construction**

Nickel-Clad, Inconel-Clad, and Monel-Clad Steels are products of Lukens Steel Company, Coatesville, Pa., developed for heavy processing and transportation equipment, where they afford the benefits of pure Nickel, Inconel or Monel at low cost.

These bi-metals consist of a cladding layer of Nickel, Inconel, or Monel permanently bonded by hot rolling to a heavier base plate of steel. They are so produced that no separation of the layers occurs under any normal condition of temperature change, pressure, vacuum or mechanical shock and they can be bent, formed or welded without danger of buckling or peeling.

All of these clad materials are available in a wide range of sizes, in thicknesses from  $\frac{3}{16}$  inches up, with cladding normally 10% to 20% of the total plate thickness. Other percentages up to 50% are also available.

**A large Inconel-Clad Paper Mill Digester. The superior corrosion resistance of Inconel-Clad Digesters enable them to give years of trouble-free service.**



**Nickel-Clad Collandria pans used in sugar refineries to combat corrosive effects of acid wash liquids.**

## INDUSTRIAL PRODUCTS

### CLAD PLATES (Continued)

**Monel-Clad — Inconel-Clad —  
Nickel-Clad — Stainless-Clad**

These are commercial economical corrosion-resistant bi-metals with a surface of alloy sheet and a base of steel plate hot rolled together, making a perfect bond.

The alloy normally constitutes from 10% to 20% of the total thickness of the plate.

Sheared and Flame-Cut Plate Sizes of Lukens Nickel-Clad and Stainless-Clad Steels																				Diameter of Circle	
Width in Inches																					
48	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	178
																				FOR SIZES BEYOND THESE LIMITS REFER TO YOUR NEAREST METAL GOODS OFFICE	
3/16	480	480	480	480	480	480	440	410	385	365	345	330	315	300	.....	.....	.....	.....	.....	.....	132
1/4	480	480	480	480	480	480	440	410	385	365	345	330	315	300	260	220	180	.....	.....	.....	150
5/16	480	480	480	480	480	480	480	480	480	480	470	450	430	410	390	370	360	.....	.....	.....	162
3/8	480	480	480	480	480	480	480	480	480	480	470	460	440	420	400	380	370	325	310	.....	.....
																				.....	
7/16	480	480	480	480	480	480	480	480	480	480	480	460	430	410	390	370	325	310	.....	.....	162
1/2	480	480	480	480	480	480	480	480	480	480	480	480	460	440	430	410	370	325	310	195	.....
9/16	480	480	480	480	480	480	480	480	480	480	480	480	460	450	430	380	325	310	195	.....	.....
5/8	480	480	480	480	480	480	480	480	480	480	480	480	470	460	440	390	340	310	195	180	.....
																				.....	
1 1/16	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	460	400	350	310	195
3/4	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	460	410	360	310	195
7/8	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	460	420	370	310	195
1	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	460	430	380	310	195
																				.....	
1 1/4	480	480	480	480	480	480	480	480	480	480	480	480	460	435	420	400	385	370	310	195	180
1 1/2	480	480	480	480	480	480	480	480	480	480	450	425	405	385	365	350	335	320	310	300	195
1 3/4	480	480	480	480	480	480	465	435	410	385	365	345	330	315	300	285	275	265	255	190	178
2	480	480	480	480	470	435	405	380	360	340	320	303	290	275	265	255	240	235	225	190	174

CLAD PLATE

## WEIGHTS

## DATA

# CLAD PLATES (Continued)

Theoretical  
Plate  
Weights  
Per  
Square Foot

Thickness (in inches)	Chromium Nickel Stainless-Clad		Straight Chromium Stainless-Clad		Nickel-Clad		Inconel-Clad		Monel-Clad	
	10%	20%	10%	20%	10%	20%	10%	20%	10%	20%
3/16	7.67	7.70	7.66	7.67	7.75	7.85	7.71	7.78	7.75	7.84
1/4	10.23	10.26	10.21	10.22	10.34	10.47	10.29	10.37	10.33	10.46
5/16	12.79	12.83	12.76	12.78	12.92	13.09	12.86	12.96	12.91	13.07
3/8	15.35	15.39	15.32	15.33	15.50	15.71	15.43	15.56	15.49	15.69
7/16	17.90	17.96	17.87	17.89	18.09	18.32	18.00	18.15	18.07	18.30
1/2	20.46	20.52	20.42	20.44	20.67	20.94	20.57	20.74	20.66	20.92
9/16	23.02	23.09	22.97	23.00	23.25	23.56	23.14	23.33	23.24	23.53
5/8	25.58	25.65	25.53	25.55	25.84	26.18	25.71	25.93	25.82	26.14
11/16	28.13	28.22	28.08	28.11	28.42	28.79	28.28	28.52	28.40	28.76
3/4	30.69	30.78	30.63	30.66	31.00	31.41	30.86	31.11	30.98	31.37
7/8	35.81	35.91	35.74	35.77	36.17	36.65	36.00	36.30	36.15	36.60
1	40.92	41.04	40.84	40.88	41.34	41.88	41.14	41.48	41.31	41.83
1 1/2	61.38	61.56	61.26	61.32	62.01	62.82	61.71	62.22	61.97	62.75
2	81.84	82.08	81.68	81.76	82.68	83.76	82.28	82.96	82.62	83.66

See note at beginning of "Permissible Variations" table on next page.



# INDUSTRIAL PRODUCTS

## CLAD PLATES (Continued)

### Permissible Variations

Note: To the nominal weights per square foot shown on the preceding page, must be added the percentage of allowable overweight according to width and thickness of plates which, in accordance with Manufacturers' Standard Practice, is given in the table below:

### THICKNESS AND WEIGHT — When ordered to Thickness

Plates 2" and Under in Thickness.

Excess in Average Weight of Lots for Widths given in inches, expressed in percentage of Nominal Weight.

### W I D T H S

Specified Thickness (in inches)	48" and under	48" excl. to 60" excl.	60" to 72" excl.	72" to 84" excl.	84" to 96" excl.	96" to 108" excl.	108" to 120" excl.	120" to 132" excl.	132" to 144" excl.	144" to 168" excl.	168" and over
3/16 TO 1/4, EXCL.	7.00	8.00	9.00	10.00	12.00	14.00	16.00	18.00	21.00	—	—
1/4 TO 5/16, EXCL.	6.00	7.00	8.00	9.00	10.00	12.00	14.00	16.00	19.00	—	—
5/16 TO 3/8, EXCL.	5.00	6.00	7.00	8.00	9.00	10.00	12.00	14.00	17.00	18.00	—
3/8 TO 7/16, EXCL.	4.50	5.00	6.00	7.00	8.00	9.00	10.00	12.00	15.00	16.00	18.00
7/16 TO 1/2, EXCL.	4.00	4.50	5.00	6.00	7.00	8.00	9.00	10.00	13.00	14.00	16.00
1/2 TO 5/8, EXCL.	4.00	4.00	4.50	5.00	6.00	7.00	8.00	9.00	11.00	12.00	14.00
5/8 TO 3/4, EXCL.	4.00	4.00	4.00	4.50	5.00	6.00	7.00	8.00	9.00	10.00	12.00
3/4 TO 1, EXCL.	3.50	4.00	4.00	4.00	4.50	5.00	6.00	7.00	8.00	9.00	11.00
1 TO 1 1/2, EXCL.	3.50	3.50	4.00	4.00	4.00	4.50	5.00	6.00	7.00	8.00	9.00
1 1/2 TO 2, (INCL.)	3.50	3.50	4.00	4.00	4.00	4.50	5.00	6.00	7.00	8.00	9.00

Standard Variation under specified thickness, .01 inch.

Standard Variations in Overweight for circular and sketch plates are 25% greater than amounts shown above.

Standard Variations in Overweight for single plates are 1 1/2 times the amounts indicated above.

The term "lot" means all plates of each tabular width and thickness gauge represented in each shipment.

WEIGHTS

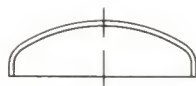
DATA

# INDUSTRIAL PRODUCTS

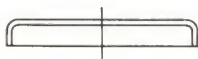
## CLAD STEEL FORMED HEADS



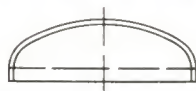
Standard Flanged and Dished Head



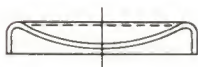
"Code" Flanged and Dished Head



Flanged Only Head



Elliptical Dished Head



Reverse Dished Head



Dished Only Head



Flanged Head with  
Toed Out Flange



Flanged and Dished, Belled Head



Flanged Only and Belled Head



Flanged Head with Toed in Flange



Flared Dished Head

SHEET

ROD • BAR • WIRE

WEIGHTS

DATA

## HOW MUCH DOES IT WEIGH

This section is designed to give you information on weights not found in other parts of the catalog. The tables on the following pages contain weights that are commonly used. If the information you want is not listed here, please contact our nearest warehouse sales office. We will be happy to help you get the data you need.



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# WEIGHTS

## THEORETICAL WEIGHTS

The weights shown in this section, and throughout the rest of the Metalog, have been carefully compiled and checked and are assumed to be theoretically correct. Their exactness cannot be guaranteed, however, since variations must be expected in actual practice.

Please be sure to get in touch with our nearest warehouse sales office if you have any questions on weights. We will do our best to be helpful.

## ORDER BY DECIMALS

For accuracy in filling orders we strongly recommend the use of decimal parts of an inch rather than gauge numbers to indicate thickness.

## TELEPHONES OF OFFICES AND WAREHOUSES

New York, New York  
.....WOrth 4-2800  
Carteret, N. J. . . .YOrktown 9-2000  
Cambridge, Mass.  
.....TRowbridge 6-4680  
Harrison N. J. . . .HUMboldt 5-5900  
Philadelphia, Pa. . . .BALdwin 9-2323  
Baltimore, Md. . . .WIndsor 4-2000  
Buffalo, N. Y. . . .TRiangle 6-3100  
Syracuse, N. Y. . . .HOward 3-6241  
Windsor, Conn. . . .phone 688-4921  
Rochester, N. Y. . . .BUtler 8-2141

# WEIGHTS

## COMPARATIVE WEIGHTS OF SHEETS

In Pounds per Square Foot

Gauge Number	B. & S. GAUGE (Rounded off at 4 decimals)				U. S. S. GAUGE (Carried out to 4 decimals)		
	Decimal Equivalent in Inches	1100 Aluminum	Brass	Copper	Decimal Equivalent in Inches	Monel	Stainless Steel 18-8
40	.0031	.0437	.1366	.1437	.....	.....	.....
39	.0035	.0494	.1542	.1623	.....	.....	.....
38	.0040	.0564	.1763	.1855	.0062	.2903	.2646
37	.0045	.0635	.1983	.2087	.0066	.3087	.2814
36	.0050	.0706	.2203	.2318	.0070	.3226	.2940
35	.0056	.0790	.2468	.2597	.0078	.3594	.3276
34	.0063	.088	.2776	.2921	.0085	.3963	.3612
33	.0071	.099	.3129	.3292	.0093	.433	.395
32	.0080	.112	.3525	.3709	.0101	.470	.427
31	.0089	.124	.3922	.4127	.0109	.502	.459
30	.0100	.140	.4406	.4637	.0125	.576	.525
29	.0113	.158	.4979	.5240	.0140	.650	.591
28	.0126	.176	.5552	.5842	.0156	.719	.656
27	.0142	.198	.6257	.6584	.0171	.793	.722
26	.0159	.222	.7006	.7373	.0187	.827	.788
25	.0179	.250	.7887	.8300	.0218	.965	.919
24	.0201	.280	.8857	.9320	.0250	1.148	1.05
23	.0226	.315	.9958	1.048	.0281	1.286	1.18
22	.0254	.353	1.115	1.173	.0312	1.424	1.31
21	.0285	.398	1.256	1.321	.0343	1.562	1.44
20	.0320	.447	1.410	1.484	.0375	1.700	1.58
19	.0359	.501	1.582	1.665	.0437	1.975	1.84
18	.0403	.563	1.776	1.869	.0500	2.297	2.10
17	.0453	.632	1.996	2.100	.0562	2.572	2.37
16	.0508	.717	2.238	2.355	.0625	2.848	2.63
15	.0571	.806	2.516	2.648	.0703	3.216	2.95
14	.0641	.905	2.825	2.972	.0781	3.583	3.28
13	.0720	1.016	3.173	3.338	.0937	4.272	3.94
12	.0808	1.14	3.560	3.747	.1093	5.007	4.59
11	.0907	1.279	3.997	4.206	.1250	5.742	5.25
10	.1019	1.437	4.490	4.725	.1406	6.431	5.91
9	.1144	1.612	5.041	5.304	.1562	7.166	6.57
8	.1285	1.813	5.662	5.958	.1718	7.855	7.22
7	.1443	2.036	6.358	6.691	.1875	8.590	7.985
6	.1620	2.286	7.138	7.512	.2031	9.325	8.650
5	.1819	2.567	8.015	8.434	.2187	10.01	9.315
4	.2043	2.883	9.002	9.473	.2343	10.75	9.981
3	.2294	3.237	10.11	10.64	.2500	11.48	10.646
2	.2576	3.635	11.35	11.94	.2656	12.24	11.310
1	.2893	4.083	12.75	13.41	.2812	12.96	11.977

For weights of other metals use Conversion Factors on pages 250 and 251  
For close decimal comparison of gauge thicknesses, see table at back of Data Section.

SHEET

ROD • BAR • WIRE

TUBING • PIPE CONVERSION FACTORS

MONEL-NICKEL

DATA

WEIGHTS PER LINEAL  
FOOT OF BRASS SHEET  
AND STRIP

## WEIGHTS

Thickness		Width in Inches — Pounds per Lineal Foot											
B. & S. Gauge	Decimal	1/16"	3/32"	1/8"	5/32"	3/16"	7/32"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"
1	.2893	.0663	.0995	.1326	.1658	.1989	.2327	.2652	.3315	.3991	.5317	.6643	.7969
2	.2576	.0590	.0885	.1180	.1476	.1771	.2071	.2361	.2951	.3553	.4733	.5913	.7094
3	.2294	.0526	.0789	.1051	.1314	.1577	.1845	.2103	.2629	.3164	.4216	.5267	.6319
4	.2043	.0468	.0702	.0936	.1170	.1404	.1643	.1872	.2341	.2818	.3754	.4690	.5626
5	.1819	.0417	.0625	.0834	.1042	.1250	.1463	.1667	.2084	.2509	.3342	.4176	.5009
6	.1620	.0371	.0568	.0746	.0929	.1115	.1306	.1487	.1859	.2231	.2974	.3718	.4461
7	.1443	.03306	.04959	.0663	.0828	.09935	.1160	.1325	.1656	.1987	.2649	.3312	.3974
8	.1285	.02944	.04416	.0589	.07375	.08847	.1032	.1180	.1475	.1769	.2359	.2949	.3539
9	.1144	.02621	.03932	.0525	.06565	.07876	.0919	.1050	.1313	.1575	.2100	.2625	.3151
10	.1019	.02334	.03502	.0468	.05845	.07016	.0822	.09354	.1169	.1403	.1871	.2339	.2806
11	.0907	.02078	.03118	.0416	.0520	.06245	.0733	.08326	.1041	.1249	.1665	.2082	.2498
12	.0808	.01851	.02777	.03709	.04636	.05563	.0653	.07417	.09272	.1113	.1483	.1854	.2225
13	.0720	.0165	.02475	.03305	.04131	.04957	.0580	.06610	.08262	.0991	.1322	.1652	.1983
14	.0641	.01469	.02204	.02942	.03678	.04413	.0516	.05884	.07355	.0883	.1177	.1471	.1765
15	.0571	.01308	.01970	.02621	.03276	.03931	.0459	.05242	.06552	.0786	.1048	.1310	.1573
16	.0508	.01164	.01746	.02332	.02935	.03498	.0411	.04663	.05829	.0700	.0933	.1166	.1399
17	.0453	.01038	.01557	.02079	.02599	.03119	.0363	.04159	.05198	.0624	.0832	.1040	.1248
18	.0403	.00924	.01385	.01850	.02312	.02775	.0325	.0370	.04624	.0555	.0740	.0925	.1110
19	.0359	.00823	.01234	.01648	.0206	.02472	.02893	.03296	.0412	.0494	.0659	.0824	.0988
20	.0320	.00733	.01100	.01469	.01836	.02203	.02579	.02933	.03672	.0441	.0588	.0734	.0881

For weights of other metals use Conversion Factors on pages 250 and 251



# WEIGHTS

## WEIGHTS PER LINEAL FOOT OF BRASS SHEET AND STRIP (Continued)

Thickness		Width in Inches — Pounds per Lineal Foot											
B. & S. Gauge	Decimal	1/16"	3/32"	1/8"	5/32"	3/16"	1/32"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"
21	.0285	.00656	.00984	.01312	.01641	.01969	.02297	.02625	.0328	.0394	.0525	.0656	.0787
22	.0254	.00583	.00874	.01165	.01456	.01748	.02039	.02330	.02913	.0350	.0466	.0583	.0699
23	.0226	.00520	.00781	.01041	.01301	.01561	.01821	.02081	.02602	.0312	.0416	.0520	.0624
24	.0201	.00463	.00694	.00926	.01157	.01388	.01620	.01851	.02314	.02777	.0370	.0463	.0555
25	.0179	.00412	.00618	.00824	.01030	.01236	.01443	.01649	.02061	.02473	.0330	.0412	.0495
26	.0159	.00366	.00549	.00732	.00915	.01098	.01281	.01464	.01830	.02197	.02929	.0366	.0439
27	.0142	.00327	.00490	.00654	.00817	.00981	.01144	.01308	.01635	.01962	.02616	.0327	.0392
28	.0126	.002898	.00435	.00580	.00725	.00870	.01015	.01160	.01451	.01741	.02321	.02901	.0348
29	.0113	.002596	.00390	.00520	.00650	.00781	.00911	.01041	.01301	.01561	.02081	.02602	.0312
30	.0100	.002303	.00345	.00461	.00576	.00691	.00806	.00921	.01153	.01381	.01842	.02303	.02763
31	.0089	.002049	.00307	.00410	.00512	.00615	.00717	.00820	.01025	.01230	.01639	.02049	.02459
32	.0080	.001842	.002763	.00368	.00461	.00553	.00644	.00737	.00921	.01105	.01474	.01842	.02210
33	.0071	.001635	.002452	.00327	.00409	.00490	.00572	.00654	.00817	.00981	.01308	.01635	.01962
34	.0063	.001451	.002176	.002901	.00363	.00435	.00508	.00580	.00725	.00870	.01160	.01451	.01741
35	.0056	.001289	.001934	.002579	.00322	.00387	.00451	.00516	.00645	.00774	.01032	.01290	.01547
36	.0050	.001151	.001727	.002303	.002879	.00345	.00403	.00461	.00576	.00691	.00921	.01151	.01382
37	.0045	.001036	.001554	.002072	.002590	.00311	.00363	.00415	.00518	.00622	.00829	.01036	.01243
38	.0040	.000921	.001382	.001842	.002303	.002763	.00322	.00368	.00461	.00553	.00737	.00921	.01105
39	.0035	.000806	.001209	.001612	.002015	.002418	.002821	.00322	.00403	.00484	.00645	.00806	.00967
40	.0031	.000714	.001071	.001428	.001784	.002141	.002498	.002855	.00357	.00428	.00571	.00714	.00857

For weights of other metals use Conversion Factors on pages 250 and 251

ROD • BAR • WIRE

TUBING • PIPE

CONVERSION FACTORS

DATA

# WEIGHTS PER LINEAL FOOT OF BRASS SHEET AND STRIP (Continued)

Thickness		Width in Inches — Pounds per Lineal Foot											
B. & S. Gauge	Decimal	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"
1	.2893	1.065	2.129	3.19	4.26	5.32	6.39	7.45	8.52	9.58	10.65	11.71	12.75
2	.2576	.950	1.901	2.851	3.80	4.75	5.70	6.65	7.60	8.55	9.50	10.45	11.35
3	.2294	.885	1.770	2.655	3.54	4.42	5.31	6.19	7.08	7.96	8.85	9.73	10.11
4	.2043	.788	1.577	2.365	3.15	3.94	4.73	5.52	6.31	7.09	7.88	8.67	9.003
5	.1819	.670	1.353	2.029	2.712	3.38	4.06	4.74	5.41	6.09	6.70	7.37	8.017
6	.1620	.5949	1.190	1.790	2.387	2.984	3.58	4.18	4.77	5.37	5.97	6.564	7.139
7	.1443	.5299	1.060	1.591	2.122	2.652	3.18	3.71	4.24	4.77	5.30	5.832	6.358
8	.1285	.4719	.9437	1.415	1.886	2.358	2.829	3.30	3.77	4.24	4.72	5.187	5.662
9	.1144	.4201	.8402	1.260	1.680	2.100	2.520	2.940	3.36	3.78	4.20	4.620	5.042
10	.1019	.3742	.7484	1.127	1.503	1.879	2.255	2.603	3.01	3.38	3.76	4.134	4.490
11	.0907	.3331	.6661	1.005	1.341	1.676	2.011	2.347	2.682	3.02	3.35	3.687	3.998
12	.0808	.2967	.5934	.895	1.194	1.492	1.790	2.089	2.387	2.686	2.984	3.282	3.561
13	.0720	.2644	.5288	.796	1.061	1.326	1.591	1.857	2.122	2.387	2.652	2.917	3.171
14	.0641	.2354	.4708	.707	.943	1.179	1.415	1.650	1.886	2.122	2.358	2.594	2.824
15	.0571	.2097	.4193	.630	.840	1.050	1.260	1.470	1.680	1.890	2.100	2.310	2.515
16	.0508	.1865	.3731	.564	.752	.939	1.127	1.315	1.503	1.691	1.879	2.066	2.239
17	.0453	.1663	.3327	.497	.663	.829	.995	1.160	1.326	1.492	1.658	1.824	1.994
18	.0403	.1480	.2960	.445	.594	.742	.891	1.039	1.188	1.336	1.485	1.633	1.776
19	.0359	.1318	.2636	.397	.529	.661	.794	.926	1.058	1.190	1.323	1.455	1.582
20	.0320	.1175	.2350	.354	.472	.589	.707	.825	.943	1.061	1.179	1.296	1.408

For weights of other metals use Conversion Factors on pages 250 and 251

# WEIGHTS

## WEIGHTS PER LINEAL FOOT OF BRASS SHEET AND STRIP (Continued)

Thickness		Width in Inches — Pounds per Lineal Foot											
B. & S. Gauge	Decimal	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"
21	.0285	.1050	.2100	.315	.420	.525	.630	.735	.840	.945	1.050	1.155	1.254
22	.0254	.0932	.1864	.2796	.373	.466	.559	.652	.746	.839	.932	1.025	1.117
23	.0226	.0833	.1665	.2498	.333	.416	.500	.583	.666	.749	.833	.916	.9946
24	.0201	.0740	.1481	.2221	.2962	.370	.444	.518	.592	.666	.740	.814	.8857
25	.0179	.0659	.1319	.1978	.2638	.330	.396	.462	.528	.593	.659	.725	.7887
26	.0159	.0586	.1172	.1757	.2343	.2929	.351	.410	.469	.527	.586	.6439	.7024
27	.0142	.0513	.1026	.1540	.2053	.2566	.308	.359	.411	.462	.513	.5646	.6255
28	.0126	.0464	.0928	.1393	.1857	.2321	.2785	.325	.371	.418	.464	.5106	.5570
29	.0113	.0416	.0833	.1249	.1665	.2081	.2498	.2914	.333	.375	.416	.4579	.4961
30	.0100	.0368	.0737	.1105	.1474	.1842	.2210	.2579	.2947	.332	.368	.4048	.4417
31	.0089	.0328	.0656	.0984	.1312	.1639	.1957	.2295	.2623	.2951	.328	.3606	.3934
32	.0080	.02947	.0589	.0884	.1179	.1474	.1768	.2063	.2358	.2652	.2947	.3242	.3503
33	.0071	.02616	.0523	.0785	.1046	.1308	.1569	.1831	.2092	.2354	.2616	.2877	.3120
34	.0063	.02321	.0464	.0696	.0928	.1160	.1393	.1625	.1857	.2089	.2321	.2553	.2778
35	.0056	.02063	.0413	.0619	.0825	.1032	.1238	.1444	.1650	.1857	.2063	.2270	.2474
36	.0050	.01842	.0368	.0553	.0737	.0921	.1105	.1289	.1474	.1658	.1842	.2026	.2203
37	.0045	.01658	.0332	.0497	.0663	.0829	.0995	.1160	.1326	.1492	.1658	.1824	.1962
38	.0040	.01474	.02947	.0442	.0589	.0737	.0884	.1032	.1169	.1326	.1474	.1621	.1747
39	.0035	.01289	.02579	.0387	.0516	.0645	.0774	.0903	.1032	.1160	.1289	.1419	.1556
40	.0031	.01142	.02284	.0343	.0457	.0571	.0685	.0799	.0914	.1028	.1142	.1256	.1386

For weights of other metals use Conversion Factors on pages 250 and 251

For weights of other metals use Conversion Factors on pages 250 and 251

ROD • BAR • WIRE

TUBING • PIPE CONVERSION FACTORS

DATA



# WEIGHTS

## COMPARATIVE WEIGHTS OF SHEETS AND PLATES

In Pounds per Square Foot

Thickness in inches	Decimal Equi- valent	1100 Aluminum	Brass	Copper	Monel	Stainless Steel 18-8
$\frac{1}{32}$	.0313	.442	1.377	1.449	1.424	1.31
$\frac{1}{16}$	.0625	.882	2.754	2.898	2.848	2.63
$\frac{3}{32}$	.0938	1.32	4.131	4.347	4.272	3.94
$\frac{1}{8}$	.1250	1.76	5.508	5.796	5.742	5.25
$\frac{9}{32}$	.1563	2.21	6.885	7.245	7.166	6.57
$\frac{3}{16}$	.1875	2.65	8.262	8.694	8.590	7.985
$\frac{7}{32}$	.2188	3.09	9.640	10.145	10.01	9.315
$\frac{1}{4}$	.2500	3.53	11.02	11.59	11.48	10.646
$\frac{5}{16}$	.3125	4.41	13.77	14.49	14.33	13.308
$\frac{3}{8}$	.3750	5.29	16.52	17.39	17.23	15.968
$\frac{7}{16}$	.4375	6.17	19.28	20.29	20.07	18.630
$\frac{1}{2}$	.5000	7.06	22.03	23.18	22.97	21.291
$\frac{9}{16}$	.5625	7.94	24.79	26.08	25.81	24.185
$\frac{5}{8}$	.6250	8.82	27.54	28.98	28.71	26.614
$\frac{11}{16}$	.6875	9.70	30.29	31.88	31.56	29.276
$\frac{3}{4}$	.7500	10.58	33.05	34.78	34.45	31.937
$\frac{13}{16}$	.8125	11.47	35.80	37.67	37.44	34.599
$\frac{7}{8}$	.8750	12.35	38.56	40.57	40.19	37.260
$\frac{15}{16}$	.9375	13.23	41.31	43.47	43.20	39.922
1	1.0000	14.11	44.06	46.37	45.94	42.582
$\frac{11}{16}$	1.0625	14.99	46.82	49.27	48.96	45.244
$\frac{13}{16}$	1.1250	15.87	49.57	52.16	51.84	47.905
$\frac{13}{16}$	1.1875	16.76	52.33	55.06	54.72	50.567
$1\frac{1}{4}$	1.2500	17.64	55.08	57.96	57.42	53.228
$1\frac{5}{16}$	1.3125	18.52	57.83	60.86	60.48	55.890
$1\frac{3}{8}$	1.3750	19.40	60.59	63.76	63.36	58.550
$1\frac{7}{16}$	1.4375	20.28	63.34	66.65	66.24	61.212
$1\frac{1}{2}$	1.5000	21.17	66.10	69.55	68.90	63.873
$1\frac{9}{16}$	1.5625	22.05	68.85	72.45	72.00	66.535
$1\frac{5}{8}$	1.6250	22.93	71.60	75.35	74.88	69.196
$1\frac{11}{16}$	1.6875	23.81	74.36	78.25	77.76	71.858
$1\frac{3}{4}$	1.7500	24.69	77.11	81.14	80.39	74.519
$1\frac{13}{16}$	1.8125	25.58	79.87	84.04	83.52	77.181
$1\frac{7}{8}$	1.8750	26.46	82.62	86.94	86.40	79.843
$1\frac{15}{16}$	1.9375	27.34	85.37	89.84	89.28	82.504
2	2.0000	28.22	88.13	92.74	91.87	85.164

For weights of other metals use Conversion Factors on pages 250 and 251

# WEIGHTS

## COMPARATIVE WEIGHTS OF ROUND ROD

In Pounds per Foot

Diameter in Inches	Decimal Equiv- alent	1100 Aluminum	Brass	Copper	Monel	Stainless Steel 18-8
1/16	.0625	.0036	.0113	.0119	.011	.010
1/8	.125	.0145	.0452	.0474	.047	.042
3/16	.1875	.0324	.1017	.1067	.106	.094
1/4	.250	.0577	.1808	.1897	.188	.167
5/16	.3125	.0901	.2826	.2964	.294	.261
3/8	.375	.1297	.4069	.4268	.423	.376
7/16	.4375	.1766	.5538	.5809	.575	.511
1/2	.500	.2306	.7234	.7587	.752	.668
9/16	.5625	.2919	.9155	.9602	.951	.845
5/8	.625	.3604	1.130	1.185	1.17	1.043
11/16	.6875	.4361	1.368	1.434	1.42	1.262
3/4	.750	.5190	1.628	1.707	1.69	1.502
13/16	.8125	.6091	1.910	2.003	1.98	1.763
7/8	.875	.7064	2.215	2.324	2.30	2.044
15/16	.9375	.811	2.543	2.667	2.64	2.347
1	1.000	.9227	2.893	3.035	3.01	2.670
1 1/16	1.0625	1.0416	3.266	3.426	3.39	3.015
1 1/8	1.125	1.1677	3.662	3.841	3.81	3.380
1 3/16	1.1875	1.3012	4.080	4.279	4.24	3.766
1 1/4	1.250	1.4417	4.521	4.742	4.70	4.172
1 5/16	1.3125	1.5895	4.984	5.228	5.18	4.600
1 3/8	1.375	1.7445	5.470	5.738	5.68	5.049
1 7/16	1.4375	1.9066	5.979	6.271	6.21	5.518
1 1/2	1.500	2.076	6.510	6.828	6.76	6.009
1 9/16	1.5625	2.2527	7.064	7.409	7.34	6.519
1 5/8	1.625	2.4364	7.640	8.014	7.94	7.051
1 11/16	1.6875	2.6276	8.239	8.642	8.56	7.604
1 3/4	1.750	2.8257	8.861	9.294	9.21	8.178
1 13/16	1.8125	3.0312	9.505	9.970	9.88	8.773
1 7/8	1.875	3.2437	10.17	10.67	10.6	9.388
1 15/16	1.9375	3.4637	10.86	11.39	11.3	10.02
2	2.000	3.6908	11.57	12.14	12.0	10.68
2 1/8	2.125	4.166	13.07	13.70	13.6	12.06
2 1/4	2.250	4.671	14.65	15.36	15.2	13.52
2 3/8	2.375	5.204	16.32	17.12	17.0	15.06
2 1/2	2.500	5.767	18.08	18.97	18.8	16.69
2 5/8	2.625	6.358	19.94	20.91	20.7	18.40
2 3/4	2.750	6.978	21.88	22.95	22.7	20.20
2 7/8	2.875	7.627	23.92	25.08	24.9	22.07
3	3.000	8.304	26.04	27.31	27.1	24.03
3 1/4	3.250	9.746	30.56	32.05	31.8	28.21
3 1/2	3.500	11.30	35.45	37.18	36.8	32.71
3 3/4	3.750	12.98	40.69	42.68	42.3	37.55
4	4.000	14.76	46.30	48.56	48.1	42.73
4 1/4	4.250	16.67	52.27	54.82	54.3	48.23
4 1/2	4.500	18.68	58.59	61.45	60.9	54.07
5	5.000	23.07	72.34	75.87	75.2	66.76
5 1/2	5.500	28.00	87.52	91.80	90.9	80.78
6	6.000	33.22	104.21	109.3	108	96.13

For weights of other metals use Conversion Factors on pages 250 and 251

ROD • BAR • WIRE

TUBING • PIPE

CONVERSION FACTORS

STAINLESS STEEL

MONEL-NICKEL

DATA

# WEIGHTS

## COMPARATIVE WEIGHTS OF SQUARE ROD

In Pounds per Foot

Size in Inches	Decimal Equiv- alent	1100 Aluminum	Brass	Copper	Monel	Stainless Steel 18-8
$\frac{1}{16}$	.0625	.0046	.0144	.0151	.015	.013
$\frac{1}{8}$	.125	.0183	.0576	.0604	.060	.053
$\frac{3}{16}$	.1875	.0413	.1295	.1358	.134	.120
$\frac{1}{4}$	.250	.0734	.2303	.2415	.239	.213
$\frac{5}{16}$	.3125	.1148	.3598	.3773	.374	.332
$\frac{3}{8}$	.375	.1652	.5181	.5434	.538	.478
$\frac{7}{16}$	.4375	.2249	.7051	.7396	.733	.651
$\frac{1}{2}$	.500	.2937	.9210	.9660	.957	.850
$\frac{9}{16}$	.5625	.3717	1.166	1.223	1.21	1.076
$\frac{5}{8}$	.625	.4589	1.439	1.509	1.50	1.328
$\frac{11}{16}$	.6875	.5553	1.741	1.826	1.81	1.607
$\frac{3}{4}$	.750	.6608	2.072	2.174	2.15	1.913
$\frac{13}{16}$	.8125	.7756	2.432	2.551	2.53	2.245
$\frac{7}{8}$	.875	.8994	2.821	2.958	2.93	2.603
$\frac{15}{16}$	.9375	1.0325	3.238	3.396	3.36	2.988
1	1.000	1.1748	3.684	3.864	3.83	3.400
$1\frac{1}{16}$	1.0625	1.3262	4.159	4.362	4.32	3.838
$1\frac{1}{8}$	1.125	1.4868	4.663	4.890	4.85	4.303
$1\frac{3}{16}$	1.1875	1.6567	5.195	5.449	5.40	4.795
$1\frac{1}{4}$	1.250	1.8356	5.756	6.038	5.98	5.313
$1\frac{5}{16}$	1.3125	2.0238	6.346	6.656	6.59	5.857
$1\frac{3}{8}$	1.375	2.2211	6.965	7.305	7.24	6.428
$1\frac{7}{16}$	1.4375	2.4276	7.613	7.985	7.91	7.026
$1\frac{1}{2}$	1.500	2.6433	8.289	8.694	8.61	7.650
$1\frac{9}{16}$	1.5625	2.862	8.994	9.434	9.35	8.301
$1\frac{5}{8}$	1.625	3.1021	9.73	10.20	10.1	8.98
$1\frac{11}{16}$	1.6875	3.34	10.49	11.00	10.9	9.68
$1\frac{3}{4}$	1.750	3.5978	11.28	11.83	11.7	10.41
$1\frac{13}{16}$	1.8125	3.85	12.10	12.69	12.6	11.17
$1\frac{7}{8}$	1.875	4.1301	12.95	13.58	13.5	11.95
$1\frac{15}{16}$	1.9375	4.40	13.83	14.51	14.4	12.76
2	2.000	4.6992	14.74	15.46	15.3	13.60
$2\frac{1}{16}$	2.125	5.419	16.64	17.45	17.3	15.35
$2\frac{1}{4}$	2.250	6.076	18.65	19.56	19.4	17.21
$2\frac{1}{8}$	2.375	6.769	20.78	21.80	21.6	19.18
$2\frac{1}{2}$	2.500	7.500	23.03	24.15	23.9	21.25
$2\frac{3}{8}$	2.625	8.269	25.39	26.63	26.4	23.43
$2\frac{1}{4}$	2.750	9.076	27.86	29.22	28.9	25.71
$2\frac{7}{8}$	2.875	9.919	30.45	31.94	31.6	28.10
3	3.000	10.80	33.16	34.78	34.5	30.60
$3\frac{1}{4}$	3.250	12.41	38.77	40.81	40.4	35.9
$3\frac{1}{2}$	3.500	14.39	44.96	47.33	46.9	41.7
$3\frac{3}{4}$	3.750	16.52	51.62	54.34	53.8	47.8
4	4.000	18.80	58.73	61.82	61.2	54.4

For weights of other metals use Conversion Factors on pages 250 and 251



# WEIGHTS

## COMPARATIVE WEIGHTS OF HEXAGONAL ROD

In Pounds per Foot

Size in Inches	Decimal Equi- valent	1100 Aluminum	Brass	Copper	Monel and Nickel	Steel
1/16	.0625	.004	.0125	.0131	.013	.012
1/8	.125	.0158	.0499	.0523	.052	.046
3/16	.1875	.0358	.1122	.1176	.117	.104
1/4	.250	.0631	.1994	.2091	.207	.184
5/16	.3125	.0990	.3116	.3268	.324	.288
3/8	.375	.1431	.4487	.4706	.466	.414
7/16	.4375	.1948	.6107	.6405	.635	.564
1/2	.500	.2543	.7976	.8366	.829	.736
9/16	.5625	.3219	1.009	1.059	1.05	.932
5/8	.625	.3974	1.246	1.307	1.30	1.15
11/16	.6875	.4810	1.508	1.582	1.57	1.39
3/4	.750	.5722	1.795	1.882	1.87	1.66
13/16	.8125	.6716	2.106	2.209	2.19	1.94
7/8	.875	.7789	2.443	2.562	2.54	2.25
15/16	.9375	.8931	2.804	2.941	2.91	2.59
1	1.000	1.016	3.190	3.346	3.32	2.94
1 1/16	1.0625	1.148	3.602	3.778	3.74	3.32
1 1/8	1.125	1.287	4.038	4.235	4.20	3.73
1 3/16	1.1875	1.433	4.499	4.719	4.67	4.15
1 1/4	1.250	1.588	4.985	5.229	5.18	4.60
1 5/16	1.3125	1.751	5.496	5.765	5.71	5.07
1 3/8	1.375	1.922	6.032	6.327	6.27	5.57
1 7/16	1.4375	2.100	6.593	6.915	6.85	6.08
1 1/2	1.500	2.286	7.178	7.529	7.46	6.63
1 9/16	1.5625	2.484	7.789	8.170	8.09	7.19
1 5/8	1.625	2.687	8.425	8.836	8.75	7.77
1 11/16	1.6875	2.897	9.085	9.529	9.43	8.38
1 3/4	1.750	3.12	9.77	10.25	10.2	9.02
1 13/16	1.8125	3.34	10.48	10.99	10.9	9.67
1 7/8	1.875	3.58	11.22	11.76	11.7	10.35
1 15/16	1.9375	3.82	11.98	12.56	12.4	11.05
2	2.000	4.07	12.76	13.39	13.3	11.78
2 1/8	2.125	4.59	14.41	15.11	15.0	13.30
2 1/4	2.250	5.15	16.15	16.94	16.8	14.91
2 3/8	2.375	5.74	18.00	18.88	18.7	16.61
2 1/2	2.500	6.36	19.94	20.91	20.7	18.40
2 5/8	2.625	7.01	21.98	23.06	22.8	20.29
2 3/4	2.750	7.69	24.13	25.31	25.1	22.27
2 7/8	2.875	8.41	26.37	27.66	27.4	24.34
3	3.000	9.16	28.71	30.12	29.8	26.50
3 1/4	3.250	10.75	33.58	35.35	35.0	31.1
3 1/2	3.500	12.46	38.94	40.99	40.6	36.07
3 3/4	3.750	14.31	44.71	47.06	46.6	41.4
4	4.000	16.28	50.86	53.54	53.0	47.11

For weights of other metals use Conversion Factors on pages 250 and 251

STAINLESS STEEL  
TUBING • PIPE  
MONEL-NICKEL  
CONVERSION FACTORS

DATA

COPPER

WELDING  
BRAZING PRODUCTS

MONEL NICKEL  
WEIGHTS

STEEL  
(C)

INDUSTRIAL PRODUCTS

# COMPARATIVE WEIGHTS OF RECTANGULAR BARS

Based on Steel in Pounds  
per Foot

Thickness (in inches)	WIDTH (in inches)																		
	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 3/4	1 5/8	1 7/8	2	2 1/8	2 1/4	2 3/8	2 1/2	2 5/8	
1/16	0.0398	0.531	0.664	0.797	0.930	1.063	1.195	1.328	1.46	1.59	1.73	1.86	1.99	2.13	2.26	2.39	2.52	2.66	2.79
1/8	0.0797	1.063	1.328	1.594	1.859	2.125	2.391	2.656	2.92	3.19	3.45	3.72	3.98	4.25	4.52	4.78	5.05	5.31	5.58
3/16	0.1195	1.594	1.992	2.391	2.789	3.188	3.586	3.984	4.38	4.78	5.18	5.58	5.98	6.38	6.77	7.17	7.57	7.97	8.37
1/4	0.1594	2.125	2.656	3.188	3.719	4.250	4.781	5.313	5.84	6.38	6.91	7.44	7.97	8.50	9.03	9.56	1.009	1.063	1.116
5/16	0.1992	2.656	3.320	3.984	4.648	5.313	5.977	6.641	7.30	7.97	8.63	9.30	9.96	1.063	1.129	1.195	1.262	1.328	1.395
3/8	0.2391	3.188	3.984	4.781	5.578	6.375	7.172	7.969	8.77	9.56	1.036	1.116	1.195	1.275	1.355	1.434	1.514	1.594	1.673
7/16	0.2789	3.719	4.648	5.578	6.508	7.438	8.367	9.297	1.023	1.116	1.209	1.302	1.395	1.488	1.580	1.673	1.766	1.859	1.952
1/2	0.3188	4.250	5.313	6.375	7.438	8.500	9.563	1.0625	1.169	1.275	1.381	1.488	1.594	1.700	1.806	1.913	2.019	2.125	2.231
5/8	0.3584	4.781	5.977	7.172	8.367	9.563	1.0625	1.169	1.275	1.381	1.488	1.594	1.700	1.806	1.913	2.019	2.125	2.231	2.337
3/4	0.3984	5.313	6.641	7.969	9.297	1.0625	1.169	1.275	1.381	1.488	1.594	1.700	1.806	1.913	2.019	2.125	2.231	2.337	2.443
7/8	0.4384	5.844	7.30	8.77	10.23	1.169	1.275	1.381	1.488	1.594	1.700	1.806	1.913	2.019	2.125	2.231	2.337	2.443	2.549
1 1/8	0.4781	6.375	7.969	9.563	1.1156	1.3016	1.4875	1.6734	1.8594	2.0453	2.2313	2.4172	2.6032	2.7892	2.9751	3.1611	3.347	3.533	3.719
1 1/4	0.5178	6.906	8.637	1.036	1.2225	1.4085	1.5945	1.7805	1.9665	2.1525	2.3385	2.5245	2.7105	2.8965	3.0825	3.2685	3.4545	3.6405	3.8265
1 1/2	0.5575	7.438	9.297	1.1156	1.3016	1.4875	1.6734	1.8594	2.0453	2.2313	2.4172	2.6032	2.7892	2.9751	3.1611	3.347	3.533	3.719	3.905
1 3/4	0.5972	7.969	9.92	1.195	1.381	1.567	1.753	1.939	2.125	2.311	2.497	2.683	2.869	3.055	3.241	3.427	3.613	3.799	3.985
1 5/8	0.637	8.500	1.0625	1.25	1.4375	1.625	1.8125	2.0	2.1875	2.375	2.5625	2.75	2.9375	3.125	3.3125	3.5	3.6875	3.875	4.0625
1 7/8	0.6769	9.031	1.1156	1.3016	1.4875	1.6734	1.8594	2.0453	2.2313	2.4172	2.6032	2.7892	2.9751	3.1611	3.347	3.533	3.719	3.905	4.091
2	0.7172	9.563	1.169	1.355	1.541	1.727	1.913	2.1	2.286	2.472	2.658	2.844	3.03	3.216	3.402	3.588	3.774	3.959	4.145
2 1/8	0.7569	10.094	1.2225	1.4085	1.6045	1.8005	1.9965	2.1925	2.3885	2.5845	2.7805	2.9765	3.1725	3.3685	3.5645	3.7605	3.9565	4.1525	4.3485
2 1/4	0.7966	10.625	1.275	1.4645	1.6605	1.8565	2.0525	2.2485	2.4445	2.6405	2.8365	3.0325	3.2285	3.4245	3.6205	3.8165	4.0125	4.2085	4.4045
2 3/8	0.8363	11.156	1.328	1.5175	1.7135	1.9095	2.1055	2.3015	2.4975	2.6935	2.8895	3.0855	3.2815	3.4775	3.6735	3.8695	4.0655	4.2615	4.4575
2 1/2	0.876	11.688	1.381	1.5705	1.7665	1.9625	2.1585	2.3545	2.5505	2.7465	2.9425	3.1385	3.3345	3.5305	3.7265	3.9225	4.1185	4.3145	4.5105
2 5/8	0.9157	12.219	1.434	1.6235	1.8195	2.0155	2.2115	2.4075	2.6035	2.7995	2.9955	3.1915	3.3875	3.5835	3.7795	3.9755	4.1715	4.3675	4.5635
2 7/8	0.9554	12.75	1.487	1.6765	1.8725	2.0685	2.2645	2.4605	2.6565	2.8525	3.0485	3.2445	3.4405	3.6365	3.8325	4.0285	4.2245	4.4205	4.6165
3	0.9951	13.281	1.54	1.7255	1.9215	2.1175	2.3135	2.5095	2.7055	2.9015	3.0975	3.2935	3.4895	3.6855	3.8815	4.0775	4.2735	4.4695	4.6655
3 1/8	1.0348	13.812	1.594	1.7785	1.9745	2.1705	2.3665	2.5625	2.7585	2.9545	3.1505	3.3465	3.5425	3.7385	3.9345	4.1305	4.3265	4.5225	4.7185
3 1/4	1.0745	14.343	1.647	1.8315	2.0275	2.2235	2.4195	2.6155	2.8115	3.0075	3.2035	3.3995	3.5955	3.7915	3.9875	4.1835	4.3795	4.5755	4.7715
3 1/2	1.1142	14.874	1.699	1.8845	2.0805	2.2765	2.4725	2.6685	2.8645	3.0605	3.2565	3.4525	3.6485	3.8445	4.0405	4.2365	4.4325	4.6285	4.8245
3 3/4	1.1539	15.405	1.752	1.9375	2.1335	2.3295	2.5255	2.7215	2.9175	3.1135	3.3095	3.5055	3.7015	3.8975	4.0935	4.2895	4.4855	4.6815	4.8775
3 5/8	1.1936	15.936	1.805	1.9905	2.1865	2.3825	2.5785	2.7745	2.9705	3.1665	3.3625	3.5585	3.7545	3.9505	4.1465	4.3425	4.5385	4.7345	4.9305
3 7/8	1.2333	16.467	1.858	2.0435	2.2395	2.4355	2.6315	2.8275	3.0235	3.2195	3.4155	3.6115	3.8075	4.0035	4.1995	4.3955	4.5915	4.7875	4.9835
4	1.273	16.998	1.911	2.0965	2.2925	2.4885	2.6845	2.8805	3.0765	3.2725	3.4685	3.6645	3.8605	4.0565	4.2525	4.4485	4.6445	4.8405	5.0365
4 1/8	1.3127	17.529	1.964	2.1495	2.3455	2.5415	2.7375	2.9335	3.1295	3.3255	3.5215	3.7175	3.9135	4.1095	4.3055	4.5015	4.6975	4.8935	5.0895
4 1/4	1.3524	18.06	2.017	2.2025	2.3985	2.5945	2.7905	2.9865	3.1825	3.3785	3.5745	3.7705	3.9665	4.1625	4.3585	4.5545	4.7505	4.9465	5.1425
4 1/2	1.3921	18.591	2.07	2.2555	2.4515	2.6475	2.8435	3.0395	3.2355	3.4315	3.6275	3.8235	4.0195	4.2155	4.4115	4.6075	4.8035	4.9995	5.1955
4 3/4	1.4318	19.122	2.123	2.3085	2.5045	2.7005	2.8965	3.0925	3.2885	3.4845	3.6805	3.8765	4.0725	4.2685	4.4645	4.6605	4.8565	5.0525	5.2485
4 5/8	1.4715	19.653	2.176	2.3615	2.5575	2.7535	2.9495	3.1455	3.3415	3.5375	3.7335	3.9295	4.1255	4.3215	4.5175	4.7135	4.9095	5.1055	5.3015
4 7/8	1.5112	20.184	2.229	2.4145	2.6105	2.8065	3.0025	3.1985	3.3945	3.5905	3.7865	3.9825	4.1785	4.3745	4.5705	4.7665	4.9625	5.1585	5.3545
5	1.5509	20.715	2.282	2.4675	2.6635	2.8595	3.0555	3.2515	3.4475	3.6435	3.8395	4.0355	4.2315	4.4275	4.6235	4.8195	5.0155	5.2115	5.4075
5 1/8	1.5906	21.246	2.335	2.5205	2.7165	2.9125	3.1085	3.3045	3.5005	3.6965	3.8925	4.0885	4.2845	4.4805	4.6765	4.8725	5.0685	5.2645	5.4605
5 1/4	1.6303	21.777	2.388	2.5735	2.7695	2.9655	3.1615	3.3575	3.5535	3.7495	3.9455	4.1415	4.3375	4.5335	4.7295	4.9255	5.1215	5.3175	5.5135
5 1/2	1.67	22.308	2.441	2.6265	2.8225	3.0185	3.2145	3.4105	3.6065	3.8025	3.9985	4.1945	4.3905	4.5865	4.7825	4.9785	5.1745	5.3705	5.5665
5 3/4	1.7097	22.839	2.494	2.6795	2.8755	3.0715	3.2675	3.4635	3.6595	3.8555	4.0515	4.2475	4.4435	4.6395	4.8355	5.0315	5.2275	5.4235	5.6195
5 5/8	1.7494	23.37	2.547	2.7325	2.9285	3.1245	3.3205	3.5165	3.7125	3.9085	4.1045	4.3005	4.4965	4.6925	4.8885	5.0845	5.2805	5.4765	5.6725
5 7/8	1.7891	23.901	2.6	2.7855	2.9815	3.1775	3.3735	3.5695	3.7655	3.9615	4.1575	4.3535	4.5495	4.7455	4.9415	5.1375	5.3335	5.5295	5.7255
6	1.8288	24.432	2.653	2.8385	3.0345	3.2305	3.4265	3.6225	3.8185	4.0145	4.2105	4.4065	4.6025	4.7985	4.9945	5.1905	5.3865	5.5825	5.7785
6 1/8	1.8685	24.963	2.706	2.8915	3.0875	3.2835	3.4795	3.6755	3.8715	4.0675	4.2635	4.4595	4.6555	4.8515	5.0475	5.2435	5.4395	5.6355	5.8315
6 1/4	1.9082	25.494	2.759	2.9445	3.1405	3.3365	3.5325	3.7285	3.9245	4.1205	4.3165	4.5125	4.7085	4.9045	5.1005	5.2965	5.4925	5.6885	5.8845
6 1/2	1.9479	26.025	2.812	2.9975	3.1935	3.3895	3.5855	3.7815	3.9775	4.1735	4.3695	4.5655	4.7615	4.9575	5.1535	5.3495	5.5455	5.7415	5.9375
6 3/4	1.9876	26.556	2.865	3.0505	3.2465	3.4425	3.6385	3.8345	4.0305	4.2265	4.4225	4.6185	4.8145	5.0105	5.2065	5.4025	5.5985	5.7945	5.9905
6 5/8	2.0273	27.087	2.918	3.1035	3.2995	3.4955	3.6915	3.8875	4.0835	4.2795	4.4755	4.6715	4.8675	5.0635	5.2595	5.4555	5.6515	5.8475	6.0435
6 7/8	2.067	27.618	2.971	3.1565	3.3525	3.5485	3.7445	3.9405	4.1365	4.3325	4.5285	4.7245	4.9205	5.1165	5.3125	5.5085	5.7045	5.9005	6.0965
7	2.1067	28.149	3.024	3.2095	3.4055	3.6015	3.7975	3.9935	4.1895	4.3855	4.5815	4.7775	4.9735	5.1695	5.3655	5.5615	5.7575	5.9535	6.1495
7 1/8	2.1.11																		



# WEIGHTS

## COMPARATIVE WEIGHTS OF RECTANGULAR BARS (Continued)

Based on Steel in Pounds  
per Foot

Thickness (in Inches)	2 1/4"	2 1/2"	3	3 1/4"	3 1/2"	3 3/4"	4	4 1/4"	4 1/2"	4 3/4"	5	5 1/4"	5 1/2"	5 3/4"	6
1/4	.292	.305	.319	.345	.372	.398	.425	.452	.478	.505	.531	.558	.584	.611	.638
5/16	.384	.401	.418	.449	.480	.511	.542	.573	.604	.635	.666	.697	.728	.759	.790
3/8	.476	.496	.516	.552	.588	.624	.660	.696	.732	.768	.804	.840	.876	.912	.948
1/2	.768	.800	.832	.880	.928	.976	1.024	1.072	1.120	1.168	1.216	1.264	1.312	1.360	1.408
5/8	1.160	1.208	1.256	1.320	1.384	1.448	1.512	1.576	1.640	1.704	1.768	1.832	1.896	1.960	2.024
3/4	1.552	1.616	1.680	1.760	1.840	1.920	2.000	2.080	2.160	2.240	2.320	2.400	2.480	2.560	2.640
7/8	1.944	2.024	2.104	2.200	2.296	2.392	2.488	2.584	2.680	2.776	2.872	2.968	3.064	3.160	3.256
1	2.336	2.432	2.528	2.640	2.752	2.864	2.976	3.088	3.200	3.312	3.424	3.536	3.648	3.760	3.872
1 1/8	2.728	2.836	2.944	3.072	3.200	3.328	3.456	3.584	3.712	3.840	3.968	4.096	4.224	4.352	4.480
1 1/4	3.120	3.240	3.360	3.504	3.648	3.792	3.936	4.080	4.224	4.368	4.512	4.656	4.800	4.944	5.088
1 1/2	3.512	3.648	3.784	3.944	4.104	4.264	4.424	4.584	4.744	4.904	5.064	5.224	5.384	5.544	5.704
1 3/4	3.904	4.056	4.208	4.384	4.560	4.736	4.912	5.088	5.264	5.440	5.616	5.792	5.968	6.144	6.320
2	4.296	4.464	4.632	4.824	5.016	5.208	5.400	5.592	5.784	5.976	6.168	6.360	6.552	6.744	6.936
2 1/8	4.688	4.872	5.056	5.264	5.472	5.680	5.888	6.096	6.304	6.512	6.720	6.928	7.136	7.344	7.552
2 1/4	5.080	5.280	5.480	5.704	5.928	6.152	6.376	6.600	6.824	7.048	7.272	7.496	7.720	7.944	8.168
2 1/2	5.472	5.688	5.904	6.144	6.384	6.624	6.864	7.104	7.344	7.584	7.824	8.064	8.304	8.544	8.784
2 3/4	5.864	6.096	6.328	6.584	6.840	7.096	7.352	7.608	7.864	8.120	8.376	8.632	8.888	9.144	9.400
3	6.256	6.504	6.752	7.024	7.296	7.568	7.840	8.112	8.384	8.656	8.928	9.200	9.472	9.744	10.016
3 1/8	6.648	6.904	7.160	7.448	7.736	8.024	8.312	8.600	8.888	9.176	9.464	9.752	10.040	10.328	10.616
3 1/4	7.040	7.304	7.568	7.872	8.176	8.480	8.784	9.088	9.392	9.696	10.000	10.304	10.608	10.912	11.216
3 1/2	7.432	7.704	7.976	8.296	8.616	8.936	9.256	9.576	9.896	10.216	10.536	10.856	11.176	11.496	11.816
3 3/4	7.824	8.104	8.384	8.728	9.072	9.416	9.760	10.104	10.448	10.792	11.136	11.480	11.824	12.168	12.512
4	8.216	8.504	8.792	9.152	9.512	9.872	10.232	10.592	10.952	11.312	11.672	12.032	12.392	12.752	13.112
4 1/8	8.608	8.904	9.200	9.576	9.952	10.328	10.704	11.080	11.456	11.832	12.208	12.584	12.960	13.336	13.712
4 1/4	9.000	9.304	9.608	10.000	10.392	10.784	11.176	11.568	11.960	12.352	12.744	13.136	13.528	13.920	14.312
4 1/2	9.392	9.704	10.016	10.424	10.832	11.240	11.648	12.056	12.464	12.872	13.280	13.688	14.096	14.504	14.912
4 3/4	9.784	10.104	10.424	10.848	11.272	11.696	12.120	12.544	12.968	13.392	13.816	14.240	14.664	15.088	15.512
5	10.176	10.504	10.832	11.264	11.696	12.128	12.560	12.992	13.424	13.856	14.288	14.720	15.152	15.584	16.016
5 1/8	10.568	10.904	11.240	11.688	12.136	12.584	13.032	13.480	13.928	14.376	14.824	15.272	15.720	16.168	16.616
5 1/4	10.960	11.304	11.648	12.104	12.560	13.016	13.472	13.928	14.384	14.840	15.296	15.752	16.208	16.664	17.120
5 1/2	11.352	11.704	12.056	12.520	12.984	13.448	13.912	14.376	14.840	15.304	15.768	16.232	16.696	17.160	17.624
5 3/4	11.744	12.104	12.464	12.944	13.424	13.904	14.384	14.864	15.344	15.824	16.304	16.784	17.264	17.744	18.224
6	12.136	12.504	12.872	13.360	13.848	14.336	14.824	15.312	15.800	16.288	16.776	17.264	17.752	18.240	18.728

TUBING • PIPE

CONVERSION FACTORS

## CONVERSION FACTORS

For the Weight of	Multiply the Weight of Steel by
ALUMINUM (1100)	.345
ALUMINUM (2024)	.352
BRASS	1.083
COPPER	1.131
MONEL OR NICKEL	1.120
18-8 STAINLESS STEEL	1.007



# WEIGHTS

## COMPARATIVE WEIGHTS OF WIRE

Pounds per 1000 Feet

Diameter		1100 Aluminum	Brass	Copper	Monel and Nickel
B. & S. Gauge	Decimal				
40	.0031	.....	.0276	.0299	.0297
39	.0035	.....	.0352	.0377	.0375
38	.004	.....	.0460	.0476	.0473
37	.0045	.....	.0582	.0600	.0596
36	.0050	.023	.0719	.0757	.0752
35	.0056	.029	.0902	.0954	.0948
34	.0063	.036	.1141	.1203	.1195
33	.0071	.046	.1449	.1517	.1508
32	.0080	.058	.1840	.1913	.1901
31	.0089	.074	.2277	.2413	.2398
30	.0100	.093	.2875	.3042	.3023
29	.0113	.120	.3671	.3836	.3812
28	.0126	.150	.4564	.4837	.4807
27	.0142	.190	.5796	.6100	.6062
26	.0159	.230	.7267	.7692	.7644
25	.0179	.290	.9210	.9699	.9638
24	.0201	.380	1.161	1.223	1.215
23	.0226	.490	1.468	1.542	1.532
22	.0254	.590	1.855	1.945	1.933
21	.0285	.750	2.335	2.452	2.437
20	.0320	.940	2.944	3.092	3.073
19	.0359	1.20	3.705	3.899	3.875
18	.0403	1.50	4.669	4.917	4.886
17	.0453	1.90	5.899	6.200	6.161
16	.0508	2.30	7.418	7.818	7.769
15	.0571	3.10	9.372	9.858	9.796
14	.0641	3.80	11.81	12.43	12.35
13	.0720	4.80	14.90	15.68	15.58
12	.0808	6.00	18.77	19.77	19.65
11	.0907	7.60	23.65	24.92	24.76
10	.1019	9.60	29.85	31.43	31.23
9	.1144	12.10	37.62	39.63	39.38
8	.1285	15.20	47.47	49.98	49.67
7	.1443	19.30	59.86	63.02	62.63
6	.1620	24.20	75.44	79.46	78.96
5	.1819	30.50	95.11	100.20	99.57
4	.2043	38.50	120.00	126.40	125.61
3	.2294	48.50	151.30	159.30	158.30
2	.2576	61.20	190.70	200.90	199.64
1	.2893	77.20	240.60	253.30	251.72
1/0	.3249	97.40	303.40	319.50	317.50
2/0	.3648	122.80	382.50	402.80	400.28
3/0	.4096	.....	482.30	507.90	504.73
4/0	.4600	.....	608.30	640.50	636.50

For weights of other metals use Conversion Factors on pages 250 and 251

# WEIGHTS

## COMPARATIVE WEIGHTS OF PIPE

Standard Pipe Size  
in Pounds per Foot  
Wall Shown for Brass

Nominal Size in Inches	Outside Diameter in Inches	Wall Thickness in Inches	6061 6063 Aluminum	85 Red Brass	Steel	Monel
1/8	.405	.0620	.085	.253	.245	.276
1/4	.540	.0825	.147	.4496	.425	.478
3/8	.675	.0905	.196	.6302	.568	.639
1/2	.840	.1075	.294	.9381	.851	.958
3/4	1.050	.1140	.391	1.271	1.131	1.27
1	1.315	.1265	.581	1.791	1.679	1.89
1 1/4	1.660	.1460	.786	2.633	2.273	2.56
1 1/2	1.900	.1500	.940	3.127	2.718	3.06
2	2.375	.1565	1.264	4.136	3.653	4.11
2 1/2	2.875	.1875	2.004	6.003	5.793	6.52
3	3.500	.2190	2.621	8.56	7.576	8.53
3 1/2	4.000	.2500	3.151	11.17	9.109	10.3
4	4.500	.2500	3.733	12.66	10.79	12.1
4 1/2	5.000	.2500	.....	.....	.....	.....
5	5.563	.2500	5.057	15.85	14.62	16.4
6	6.625	.2500	6.564	18.99	18.97	21.4
7	7.625	.2815	.....	.....	.....	.....
8	8.625	.3125	9.878	30.95	28.55	32.2
9	9.625	.3440	.....	.....	.....	.....
10	10.750	.3655	14.000	45.22	40.48	.....
11	11.750	.3750	.....	50.82	46.25	.....
12	12.750	.3750	17.14	55.28	50.71	.....

NOTE: Pipe is manufactured to Schedule 40, and wall thickness varies slightly. Weight per foot is for Schedule 40.

## COMPARATIVE WEIGHTS OF PIPE (Continued)

Extra Heavy Pipe Size  
in Pounds per Foot  
Wall Shown for Brass

Nominal Size in Inches	Outside Diameter in Inches	Wall Thickness in Inches	6061 6063 Aluminum	85 Red Brass	Steel	Monel
1/8	.405	.100	.109	.363	.3145	.354
1/4	.540	.123	.185	.611	.5351	.603
3/8	.675	.127	.256	.829	.7388	.832
1/2	.840	.149	.376	1.23	1.0988	1.23
3/4	1.050	.157	.510	1.67	1.474	1.66
1	1.315	.182	.751	2.46	2.172	2.45
1 1/4	1.660	.194	1.037	3.39	2.997	3.37
1 1/2	1.900	.203	1.256	4.10	3.631	4.09
2	2.375	.221	1.737	5.67	5.022	5.66
2 1/2	2.875	.280	2.650	8.66	7.661	8.63
3	3.500	.304	3.547	11.6	10.25	11.5
3 1/2	4.000	.321	4.326	14.1	12.50	14.1
4	4.500	.341	5.183	16.9	14.98	16.9
4 1/2	5.000	.375	.....	.....	.....	.....
5	5.563	.375	7.188	23.2	20.78	23.4
6	6.625	.437	9.884	32.2	28.57	32.2
7	7.625	.500	.....	.....	38.05	.....
8	8.625	.500	15.01	48.4	43.39	48.9
9	9.625	.500	.....	.....	48.73	.....
10	10.750	.500	22.25	61.1	54.74	.....

TUBING • PIPE

CONVERSION FACTORS

MONEL-NICKEL

DATA

# WEIGHTS

## COMPARATIVE WEIGHTS OF PIPE (Continued)

Double Extra Heavy Pipe Size  
in Pounds per Foot  
Wall Shown for Brass

Nominal Size (in Inches)	Outside Diameter in Inches	Wall Thickness in Inches	85 Red Brass	Copper	Steel
1/2	.840	.294	1.912	1.955	1.714
3/4	1.050	.308	2.723	2.783	2.440
1	1.310	.358	4.081	4.172	3.659
1 1/4	1.665	.382	5.816	5.945	5.214
1 1/2	1.905	.400	7.148	7.306	6.408
2	2.370	.436	10.07	10.29	9.029
2 1/2	2.870	.552	15.28	15.61	13.695
3	3.505	.600	20.73	21.19	18.583
3 1/2	4.000	.636	25.49	26.05	22.850
4	4.500	.674	30.72	31.40	27.541
4 1/2	5.000	.710	.....	37.09	32.530
5	5.563	.750	43.00	43.96	38.552
6	6.625	.864	59.30	60.61	53.160
7	7.625	.875	.....	.....	63.079
8	8.625	.875	80.78	82.57	72.424

## WEIGHT OF SQUARE STEEL TUBING

Size Out- side	Wall Thickness		Size Inside	Pounds per Foot	Size Out- side	Wall Thickness		Size Inside	Pounds per Foot
	Inches	B. W. Gauge				Inches	B. W. Gauge		
1/4	.035	20	.180	.1023	1 1/4	.049	18	1.152	.8003
	.049	18	.152	.1339		.065	16	1.120	1.0474
3/8	.035	20	.305	.1618	1 1/2	.083	14	1.084	1.3170
	.049	18	.277	.2172		.120	11	1.010	1.8439
1/2	.035	20	.430	.2213	1 3/8	.134	10	.982	2.0336
	.049	18	.402	.3005		.049	18	1.277	.8836
5/8	.065	16	.370	.3845	1 1/2	.065	16	1.245	1.1579
	.035	20	.555	.2808		.049	18	1.402	.9668
3/4	.049	18	.527	.3838	1 3/4	.065	16	1.370	1.2684
	.065	16	.495	.4950		.083	14	1.334	1.5992
7/8	.035	20	.680	.3403	2	.120	11	1.260	2.2519
	.049	18	.652	.4671		.065	16	1.620	1.4894
1	.065	16	.620	.6055	2 1/2	.083	14	1.584	1.8813
	.095	13	.560	.8462		.120	11	1.510	2.6598
1 1/8	.120	11	.510	1.0280	3	.065	16	1.870	1.7103
	.035	20	.805	.3998		.083	14	1.834	2.1635
1 1/4	.049	18	.777	.5504		.095	13	1.810	2.4610
	.065	16	.745	.7160	3 1/2	.120	11	1.760	3.0678
1 1/2	.095	13	.685	1.0076		.083	14	2.334	2.7278
	.035	20	.930	.4593	4	.120	11	2.260	3.8837
1 3/4	.049	18	.902	.6337		.180	7	2.640	6.9025
	.065	16	.870	.8264		.238	4	2.524	8.9389
2	.072	15	.856	.9087	4 1/2	.180	7	3.640	9.3503
	.083	14	.834	1.0348		.238	4	3.524	12.1753
2 1/2	.109	12	.782	1.3207					
	.065	16	.995	.9369					

For weights of other metals use Conversion Factors on pages 250 and 251



### WEIGHTS PER FOOT — SEAMLESS BRASS TUBING

### Round Tubes by Outside Diameter

[illegible]

### CONVERSION FACTORS

## DATA

A

A

For weights of other metals use Conversion Factors on pages 250 and 251

WEIGHTS PER FOOT —  
SEAMLESS BRASS TUBING  
(Continued)Round Tubes by  
Outside Diameter

THICKNESS OF WALL BY STUBS GAUGE AND DECIMAL EQUIVALENT IN INCHES—POUNDS PER LINEAL FOOT																		
SIZE	O.D. in Inches	1 .300	2 .284	3 .259	5 .220	6 .203	7 .180	8 .165	9 .148	10 .134	11 .125	12 .109	13 .095	14 .083	15 .072	16 .065	17 .058	18 .049
4		12.85	12.23	11.21	9.62	8.91	7.956	7.321	6.596	5.994	5.61	5.387	4.907	3.762	3.272	2.959	2.645	2.240
1/4		13.72	13.04	11.96	10.26	9.50	8.476	7.798	7.024	6.381	5.97	5.734	5.222	4.567	4.002	3.480	3.147	2.382
1/2		14.59	13.87	12.71	10.89	10.09	8.997	8.276	7.452	6.769	6.33	6.081	5.538	4.842	4.242	3.689	3.335	2.523
3/4		15.46	14.68	13.46	11.53	10.68	9.517	8.753	7.880	7.157	6.69	6.428	5.853	5.117	4.482	3.897	3.523	2.665
5		16.33	15.51	14.21	12.17	11.27	10.04	9.230	8.308	7.544	7.05	6.775	6.168	5.391	4.722	4.105	3.711	2.807
1/4		17.20	16.34	14.96	12.80	11.85	10.56	9.708	8.736	7.932	7.41	7.122	6.483	5.666	4.962	4.313	3.899	2.949
1/2		18.07	17.16	15.71	13.44	12.44	11.08	10.18	9.165	8.319	7.78	7.470	6.799	5.941	5.202	4.522	4.087	3.090
3/4		18.93	17.98	16.45	14.08	13.03	11.60	10.66	9.593	8.707	8.14	7.817	7.114	6.216	5.442	4.730	4.275	3.232
6		19.81	18.80	17.20	14.71	13.62	12.12	11.14	10.02	9.095	8.50	8.164	7.429	6.490	5.682	4.938	4.463	3.374
1/4		20.67	19.62	17.95	15.35	14.20	12.64	11.62	10.45	9.482	8.86	8.511	7.745	6.765	5.922	5.147	4.651	3.516
1/2		21.55	20.46	18.70	15.99	14.79	13.16	12.09	10.88	9.870	9.22	8.858	8.060	7.040	6.162	5.355	4.839	3.657
3/4		22.41	21.29	19.45	16.62	15.38	13.68	12.57	11.30	10.26	9.58	9.205	8.375	7.315	6.402	5.563	5.027	3.799
7		23.29	22.09	20.20	17.26	15.96	14.20	13.05	11.73	10.64	9.95	9.552	8.690	7.590	6.642	5.771	5.215	4.082
1/4		24.15	22.95	20.95	17.89	16.55	14.72	13.53	12.16	11.03	10.31	9.899	9.006	7.864	6.883	5.980	5.403	4.226
1/2		25.02	23.75	21.70	18.53	17.14	15.24	14.00	12.59	11.42	10.67	10.25	9.321	8.139	7.123	6.188	5.591	4.394
3/4		25.89	24.57	22.45	19.17	17.73	15.77	14.48	13.02	11.81	11.03	10.59	9.636	8.414	7.363	6.396	5.779	4.562
8			23.20	19.80	18.31	16.29	14.96	13.45	12.20	11.39	10.94	9.952	8.689	7.603	6.604	5.968	5.33	
1/4				20.44	18.90	16.81	15.44	13.87	12.58	11.75	11.29	10.27	8.964	7.843	6.813	6.156		
1/2				21.71	20.08	17.85	16.39	14.73	13.36	12.48	11.98	10.90	9.513	8.324	7.230	6.532		
3/4				22.99	21.25	18.89	17.34	15.59	14.14	13.20	12.68	11.53	10.06	9.04	7.85	7.10		
9				22.99	21.25	18.89	17.34	15.59	14.14	13.20	12.68	11.53	10.06	9.04	7.85	7.10		
1/4				27.69	23.62	21.84	19.41	17.82	16.01	14.52	13.56	13.02	11.84	10.34	9.26	8.04	7.26	
1/2				24.26	22.43	19.93	18.30	16.44	14.91	13.92	13.37	12.16	10.61	9.51	8.29	7.51		
3/4				24.26	22.43	19.93	18.30	16.44	14.91	13.92	13.37	12.16	10.61	9.51	8.29	7.51		
10				29.19	24.89	23.01	20.45	18.78	16.87	15.30	14.29	13.72	12.47	10.89				

For weights of other metals use Conversion Factors on pages 250 and 251

# WEIGHTS

## WEIGHTS PER FOOT — SEAMLESS BRASS TUBING (Continued)

SIZE	THICKNESS OF WALL BY STUBS GAUGE AND DECIMAL EQUIVALENT IN INCHES—POUNDS PER LINEAL FOOT																		
	O.D. in Inches	19 .042	20 .035	21 .032	22 .028	23 .025	24 .022	25 .020	26 .018	27 .016	28 .014	29 .013	30 .012	31 .010	32 .009	33 .008	34 .007	35 .005	36 .004
1/16						.0110	.0104	.0100	.0094	.0087	.0079	.0075	.0071*	.0061	.0056	.0051	.0045	.0034	.0027
5/64						.015	.014	.013	.012	.011	.010	.0098	.0092	.0079	.0072	.0065	.0058	.0042	.0034
3/32						.020	.018	.017	.016	.014	.013	.012	.011	.0097	.0089	.0080	.0070	.0051	.0042
7/64						.024	.022	.021	.019	.017	.015	.014	.013	.011	.010	.0093	.0083	.0060	.0049
1/8	.040	.036	.034	.031		.029	.026	.024	.0222	.020	.018	.017	.016	.013	.012	.0108	.0096	.0069	.0056
5/32	.055	.049	.046	.041	.038	.034	.031	.029	.026	.023	.022	.020	.017	.015	.015	.0137	.0121	.0087	.0070
3/16	.071	.062	.058	.052	.047	.042	.039	.035	.032	.028	.026	.024	.021	.019	.017	.0147	.0106	.0085	
7/32	.086	.075	.069	.062	.056	.050	.046	.042	.038	.033	.031	.029	.024	.022	.020	.017	.012	.0100	
1/4	.101	.089	.081	.072	.065	.058	.053	.048	.043	.038	.036	.033	.029	.024	.022	.020	.017	.012	.0100
5/16	.116	.100	.092	.082	.074	.066	.060	.055	.049	.043	.040	.037	.033	.028	.025	.022	.020	.014	.011
3/8	.132	.113	.104	.090	.083	.074	.068	.061	.055	.048	.045	.042	.037	.031	.028	.025	.022	.016	.0128
7/16	.162	.138	.127	.112	.101	.090	.082	.074	.066	.058	.054	.050	.044	.038	.034	.030	.025	.018	
1/2	.192	.163	.150	.133	.119	.106	.097	.087	.078	.069	.064	.059	.050	.045	.040	.035	.021		
5/8	.223	.188	.173	.153	.137	.122	.111	.100	.090	.079	.073	.068	.057	.051	.046	.040	.029		
3/4	.253	.214	.196	.173	.155	.138	.126	.114	.101	.089	.083	.077	.064	.058	.051	.045	.032		
7/8	.283	.239	.220	.193	.174	.153	.140	.126	.113	.099	.092	.085							
1	.344	.290	.266	.234	.210	.185	.169	.152	.136	.119	.111	.102							
	.405	.340	.312	.274	.246	.217	.198	.178	.159	.139	.130	.120							
	.466	.391	.358	.315	.282	.249	.227	.204	.182	.160	.148	.137							
1 1/8	.526	.441	.404	.355	.318	.281	.256	.231	.205										
1 1/4	.587	.492	.451	.396	.354	.313	.285	.257	.228										
1 1/2	.648	.543	.497	.436	.390	.344	.313	.282	.252										
1 3/4	.708	.593	.544	.477	.427	.376	.342	.309	.275										
2	.769	.644	.590	.517	.463	.408	.372	.335											

For weights of other metals use Conversion Factors on pages 250 and 251

STAINLESS STEEL

CONVERSION FACTORS

MONEL-NICKEL

DATA



# WEIGHTS PER FOOT — SEAMLESS BRASS TUBING

(Continued)

SIZE	THICKNESS OF WALL BY STUBS GAUGE AND DECIMAL EQUIVALENT IN INCHES—POUNDS PER LINEAL FOOT																	
O.D. in Inches	19 .042	20 .035	21 .032	22 .028	23 .025	24 .022	25 .020	26 .018	27 .016	28 .014	29 .013	30 .012	31 .010	32 .009	33 .008	34 .007	35 .005	36 .004

1 1/4	.830	.694	.636	.558	.499	.440	.400	.361										
3/4	.891	.745	.682	.598	.535	.472	.429	.387										
2	.951	.796	.729	.639	.571	.503	.458	.413										
1 1/4	1.073	.897	.821	.720	.644	.567	.516											
1 1/2	1.194	.998	.914	.801	.716	.631	.574											
3/4	1.316	1.099	1.006	.882	.788													
3	1.437	1.201	1.099	.963	.861													
1 1/4	1.559	1.302	1.191	1.044	.933													
1 1/2	1.680	1.403	1.284	1.125	1.005													
4	1.802	1.504	1.377	1.206	1.077													
1 3/4	1.923	1.606	1.469	1.287														
1 1/4	2.045	1.707	1.562	1.368														
1 1/2	2.166	1.808	1.654	1.449														
5	2.288	1.909	1.747															
1 3/4	2.409	2.011	1.839															
1 1/4	2.531	2.112	1.932															
1 1/2	2.652	2.213	2.024															
6	2.774	2.314																
1 3/4	2.895	2.416																
1 1/4	3.017																	
1 1/2	3.138																	
3/4	3.260																	
7	3.381																	

TO DETERMINE THE WEIGHT OF TUBING OF OTHER METALS,  
MULTIPLY THE WEIGHT OF BRASS BY THE FOLLOWING FAC-  
TORS:

2017 ALUMINUM	—	.337
90% COMMERCIAL BRONZE	—	1.04
COPPER	—	1.05
85% LOW BRASS	—	1.03
MONEL	—	1.05
NICKEL	—	1.05
18% NICKEL SILVER	—	1.03
5% PHOSPHOR BRONZE	—	1.03
STEEL	—	.94

# WEIGHTS

## ROUND TUBES — WEIGHTS BY INSIDE DIAMETERS

To determine the weight per foot of a tube of a given **inside** diameter; — to the weight given for the size and gauge by O.D. in the preceding table, add the weight given below for the corresponding thickness of wall by Stubs Gauge. The sum will be the weight in pounds per lineal foot by **inside** diameter.

**Thickness of Wall by Stubs Gauge — Pounds to be Added  
to O.D. Weight**

1	2	3	4	5	6	7	8	9
2.08	.187	1.55	1.31	1.12	.954	.750	.630	.507
10	11	12	13	14	15	16	17	18
.416	.333	.275	.209	.159	.120	.098	.078	.056
19	20	21	22	23	24	25	26	27
.041	.028	.024	.018	.014	.011	.009	.008	.006
28	29	30	31	32	33	34	35	36
.005	.004	.003	.002	.002	.001	.001	.0006	.0004

## CALCULATING WEIGHT OF ROUND TUBES

**To Determine the Weight in  
Pounds per Lineal Foot of a  
Seamless Tube:**

When O.D. is given:

Subtract wall thickness from O.D.  
Multiply by gauge  
Multiply by —  
11.5736 for Brass  
12.1768 for Copper

When I.D. is given:

Add wall thickness to I.D.  
Multiply by gauge  
Multiply by —  
11.5736 for Brass  
12.1768 for Copper

The above factors are arrived at by using a density of 0.037 pound per cubic inch for Yellow Brass and 0.323 pound per cubic inch for Deoxidized Copper.

CONVERSION FACTORS

DATA

# WEIGHTS

## STEEL TUBING WEIGHT FORMULAS

All weights are theoretical and predicated upon a cubic inch of steel weighing .2833 pound. Actual shipping weights may vary somewhat from these theoretical weights due to variations encountered in manufacturing practices.

### Round Seamless

$$W = 10.68 (D - t) t$$

W = weight in pounds per foot

D = outside diameter in inches and decimals of an inch

t = wall thickness in decimals of an inch

### Square Seamless

$$W = 13.60 (D - t) t$$

W = weight in pounds per foot

D = outside diameter in inches and decimals of an inch  
measured at right angles to the sides

t = wall thickness in decimals of an inch

### Rectangular Seamless

$$W = 6.7992 (A + B - 2t) t$$

W = weight in pounds per foot

A and B = the two outside dimensions in inches measured at right angles to the sides

t = wall thickness in decimals of an inch

### Conversion Formulas

Monel = steel weight  $\times 1.126$

Nickel = steel weight  $\times 1.133$

Inconel = steel weight  $\times 1.084$

Copper = steel weight  $\times 1.140$

Approximate Weights of 100 Lineal Feet  
Cold Rolled Strip Steel 1" Wide

Thick- ness inches	Wt. lbs.	Thick- ness inches	Wt. lbs.	Thick- ness inches	Wt. lbs.	Thick- ness inches	Wt. lbs.
.010	3.4	.022	7.5	.049	16.7	.095	32.3
.012	4.1	.025	8.5	.050	17.0	.109	37.2
.013	4.4	.028	9.5	.058	19.7	.120	40.8
.014	4.8	.031	10.6	.062	21.1	.125	42.5
.015	5.1	.032	10.9	.065	22.1	.134	45.6
.016	5.4	.035	11.9	.072	24.5	.148	50.3
.018	6.1	.038	12.9	.078	26.6	.165	56.1
.019	6.5	.042	14.3	.083	28.2	.180	61.3
.020	6.8	.044	15.0	.094	31.9	.187	63.8
						.250	85.0



# WEIGHTS

## SYSTEMS OF WEIGHTS

UNITED STATES AND BRITISH. THE GRAIN IS THE UNIT.

1 GRAIN = .0647987 GRAMS

### AVOIRDUPOIS

NET TON = 2000 POUNDS

= .892857 GROSS TONS

GROSS TON = 2,240 POUNDS

HUNDREDWEIGHT = 112 POUNDS

POUND = 1.215278 TROY POUNDS

STONE = .125 CWT.

Grains	Drams	Ounces	Pounds
1.	.03657	.002286	.000143
27.34375	1.	.0625	.003906
437.5	16.	1.	.0625
7.000.	256.	16.	1.

### TROY

1 TROY OUNCE = 1.097143 AVOIRDUPOIS OUNCES

175 TROY OUNCES = 192 AVOIRDUPOIS OUNCES

1 POUND TROY = .822857 POUNDS AVOIRDUPOIS

Grains	Pennyweight	Ounces	Pounds
1	.041667	.0020833	.0001736
24	1.	.05	.0041667
480	20.	1.	.0833333
5760	240.	12.	1.

## WEIGHTS OF CIRCLES

The Circumference and Areas of Circles tables on pages 340 to 345 can be used to determine quickly the weights of circles. Simply multiply the AREA in SQUARE FEET by the weight per square foot (see pages 229 and 234) of the metal.

For example, if you want the weight of a  $\frac{1}{8}$ " thick, 23" diameter brass circle . . .

MULTIPLY 5.508 pounds (weight per square foot of  $\frac{1}{8}$ " brass)

BY 2.8853 (area in Square Feet)

— 15.892 + pounds

STAINLESS STEEL

INVERSION FACTORS

MONEL-NICKEL

DATA

MA

# WEIGHTS

## WEIGHT CONVERSION FACTORS

Based On Pure Aluminum  
(1100) — Density 2.71

Weight .0979 Lbs. Per Cu. Inch

3003	=	1.01 TIMES WEIGHT OF 1100 ALUMINUM
ALCLAD 3003	=	1.01 TIMES WEIGHT OF 1100 ALUMINUM
2011	=	1.04 TIMES WEIGHT OF 1100 ALUMINUM
2017	=	1.03 TIMES WEIGHT OF 1100 ALUMINUM
2024	=	1.02 TIMES WEIGHT OF 1100 ALUMINUM
ALCLAD 2024	=	1.02 TIMES WEIGHT OF 1100 ALUMINUM
4043	=	.98 TIMES WEIGHT OF 1100 ALUMINUM
5005	=	.99 TIMES WEIGHT OF 1100 ALUMINUM
5050	=	.99 TIMES WEIGHT OF 1100 ALUMINUM
5052	=	.99 TIMES WEIGHT OF 1100 ALUMINUM
6061	=	1.00 TIMES WEIGHT OF 1100 ALUMINUM
6062	=	1.00 TIMES WEIGHT OF 1100 ALUMINUM
6063	=	1.00 TIMES WEIGHT OF 1100 ALUMINUM
7075	=	1.03 TIMES WEIGHT OF 1100 ALUMINUM
ALCLAD 7075	=	1.03 TIMES WEIGHT OF 1100 ALUMINUM
BRASS	=	3.10 TIMES WEIGHT OF 1100 ALUMINUM
COPPER	=	3.30 TIMES WEIGHT OF 1100 ALUMINUM
MONEL	=	3.24 TIMES WEIGHT OF 1100 ALUMINUM
NICKEL	=	3.26 TIMES WEIGHT OF 1100 ALUMINUM
STEEL	=	2.89 TIMES WEIGHT OF 1100 ALUMINUM
ZINC	=	2.62 TIMES WEIGHT OF 1100 ALUMINUM

## WEIGHT CONVERSION FACTORS (Continued)

Based on Brass — Density 8.46

Weight .306 Lbs. Per Cu. Inch

### COMMERCIAL BRONZE

(90%)	=	1.039 X WEIGHT OF BRASS
COPPER	=	1.052 X WEIGHT OF BRASS
LOW BRASS (80%)	=	1.023 X WEIGHT OF BRASS
LOW BRASS (85%)	=	1.033 X WEIGHT OF BRASS
MONEL	=	1.063 X WEIGHT OF BRASS
NICKEL	=	1.07 X WEIGHT OF BRASS
NICKEL SILVER (18%)	=	1.033 X WEIGHT OF BRASS
PHOSPHOR BRONZE (5%)	=	1.046 X WEIGHT OF BRASS
TOBIN BRONZE	=	0.994 X WEIGHT OF BRASS
INCONEL	=	1.023 X WEIGHT OF BRASS
NICKEL CLAD STEEL		
(10% CLAD)	=	1.045 X WEIGHT OF BRASS
MUNTZ METAL	=	1.00 X WEIGHT OF BRASS
ARCHITECTURAL BRONZE	=	1.00 X WEIGHT OF BRASS
STEEL	=	0.94 X WEIGHT OF BRASS
1100 ALUMINUM	=	0.324 X WEIGHT OF BRASS
2017 ALUMINUM	=	0.337 X WEIGHT OF BRASS

Continued on next page

# WEIGHTS

## WEIGHT CONVERSION FACTORS (Continued)

Weight of Metals  
per Cubic Inch

### ALUMINUM — WROUGHT

(1100)	=	.0979 LBS. PER CUBIC INCH
ALUMINUM — CAST	=	.0924 LBS. PER CUBIC INCH
BRASS	=	.306 LBS. PER CUBIC INCH
CAST IRON	=	.260 LBS. PER CUBIC INCH
COPPER	=	.318 LBS. PER CUBIC INCH
INCONEL	=	.307 LBS. PER CUBIC INCH
LEAD	=	.411 LBS. PER CUBIC INCH
MAGNESIUM	=	.0629 LBS. PER CUBIC INCH
MONEL	=	.319 LBS. PER CUBIC INCH
NICKEL	=	.321 LBS. PER CUBIC INCH
STEEL	=	.293 LBS. PER CUBIC INCH
ZINC	=	.2598 LBS. PER CUBIC INCH

## WEIGHT CONVERSION FACTORS (Continued)

Conversion Factors of  
Inco Alloys  
Based on Monel — Density 8.80

DURANICKEL ALLOY 301	=	.934 X WEIGHT OF MONEL
INCOLOY ALLOY 800	=	.909 X WEIGHT OF MONEL
INCONEL ALLOY 600	=	.953 X WEIGHT OF MONEL
INCONEL ALLOY X-750	=	.934 X WEIGHT OF MONEL
MONEL ALLOY 403	=	1.003 X WEIGHT OF MONEL
MONEL ALLOY K-500	=	.956 X WEIGHT OF MONEL
MONEL ALLOY 501	=	.956 X WEIGHT OF MONEL
MONEL ALLOY R-405	=	1.00 X WEIGHT OF MONEL
NICKEL 200	=	1.006 X WEIGHT OF MONEL
NI-O-NEL ALLOY 825	=	.922 X WEIGHT OF MONEL

BRASS  
STAINLESS STEEL  
MONEL-NICKEL  
CONVERSION FACTORS

DATA



# WEIGHTS

## WEIGHT CONVERSION FACTORS

Based on Carbon Steel  
40.8 Lbs. per sq. ft. per  
inch of thickness

Alloy or Metal	Factor	Alloy or Metal	Factor
ALUMINUM			
1100 ALLOY.....	.34602	BRASS.....	1.07266
2011    ".....	.35986	COPPER.....	1.14187
2017    ".....	.35640	MONEL.....	1.14187
2024    ".....	.35294	NICKEL.....	1.12803
3003    ".....	.34948	STEEL, CARBON.....	1.00000
4043    ".....	.34360	STEEL, STAINLESS	
5052    ".....	.34256	300 SERIES.....	1.02941
5056    ".....	.33702	400 SERIES.....	1.00980
6053    ".....	.34360	TIN.....	.93079
6061    ".....	.34602	ZINC.....	.89965
6151    ".....	.34256		
7075    ".....	.35640		
7178    ".....	.35640		



BRASS • COPPER

STAINLESS STEEL

MONEL-NICKEL

NA

**WHAT DO YOU**

**WANT TO KNOW ABOUT**

## **METALS**

This data section includes many frequently used tables and charts on metals, plus general definitions on alloys. Because of space limitations, much technical information has been omitted. However, our literature library contains a wealth of technical information produced by many of the nation's leading suppliers. If you do not find the information you want in this book, call our nearest warehouse sales office. We will be happy to assist you.

**DATA**

MA

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## LITERATURE ON METALS

An extensive library of technical literature on metals is available to you, free of charge. Just call our nearest warehouse sales office and tell them what information you want.

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## ALUMINUM AND ITS ALLOYS

Aluminum's weight is about one-third that of other commonly-used metals. It is highly-resistant to the corrosive action of the atmosphere and many chemical compounds. It has high thermal and electrical conductivity. It reflects radiant energy, ranging from the short wave lengths of ultra-violet to the long waves of heat, electromagnetic, and radio. In addition, aluminum fabricates easily. It can be welded by all commercial methods.

The compounds comprising aluminum are colorless, and cause no harmful action on the human system. Ordinarily, aluminum is inert. But it can be made into a strong reducing agent by heating to very high temperatures, or by introducing certain chemicals, especially strong alkalis. When made into a reducing agent, aluminum is used to reduce refractory metals from their ores, and remove gases from molten steel.

ALCOA ALUMINUM ALLOYS are formed by combining commercially pure aluminum with small amounts of other metals. Each alloy is designed to have certain characteristics that make it superior to other alloys for specific applications. Since it is important for designers and aluminum users to have information readily available on the qualities of the various alloys, the following pages contain short explanations on each alloy.\*

There are two classes of Alcoa Aluminum Wrought Alloys:

- 1 Nonheat-treatable alloys, whose harder tempers are developed by strain hardening (cold work). Included in this group are Alloys 1100, 3003, 5052.
- 2 Alloys whose harder tempers are produced by heat treatment. This group consists of Alloys 2017, 2024, 6053, 7075.

Both groups have a wide range of tensile properties. However, the highest combinations of strength and ductility appear in the heat-treated group.

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\* A detailed booklet on this subject, "ALCOA ALUMINUM AND ITS ALLOYS", is yours for the asking. Send your request to our nearest warehouse or sales service office.

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## ALUMINUM AND ITS ALLOYS (Continued)

**NOMINAL COMPOSITION OF WROUGHT ALUMINUM ALLOYS\***

Alloy	Per Cent of Alloying Elements — Aluminum and Normal Impurities Constitute Remainder								
	Copper	Silicon	Manganese	Magnesium	Zinc	Nickel	Chromium	Lead	Bismuth
EC				99.45% MINIMUM ALUMINUM					
1100	.....	.....	1.2	.....	.....	.....	.....	.....	.....
3003†	.....	.....	1.2	1.0	.....	.....	.....	0.5	0.5
3004†	.....	.....	.....	.....	.....	.....	.....	.....	.....
2011	5.5	.....	0.8	0.4	.....	.....	.....	.....	.....
2014†	4.4	0.8	.....	0.5	.....	.....	.....	.....	.....
2017	4.0	.....	0.5	.....	.....	.....	.....	.....	.....
2117	2.5	.....	.....	0.3	.....	.....	.....	.....	.....
2118	4.0	.....	.....	0.6	.....	2.0	.....	.....	.....
2218	4.0	.....	.....	1.5	.....	2.0	.....	.....	.....
2024†	4.5	.....	0.6	1.5	.....	.....	.....	.....	.....
2025	4.5	0.8	0.8	.....	.....	.....	.....	.....	.....
4032	0.9	12.2	.....	1.1	.....	0.9	.....	.....	.....
4043	.....	5.0	.....	.....	.....	.....	.....	.....	.....
5050	.....	.....	.....	1.2	.....	.....	.....	.....	.....
6151	.....	1.0	.....	0.6	.....	.....	0.25	.....	.....
5052	.....	.....	.....	2.5	.....	.....	0.25	.....	.....
6053	.....	0.7	.....	1.3	.....	.....	0.25	.....	.....
5056	.....	.....	0.1	5.2	.....	.....	0.1	.....	.....
6061	0.25	0.6	.....	1.0	.....	.....	0.25	.....	.....
6062	0.25	0.6	.....	1.0	.....	.....	.....	.....	.....
6063	.....	0.4	.....	0.7	.....	.....	.....	.....	.....
7072	.....	.....	.....	.....	1.0	.....	.....	.....	.....
7075†	1.6	.....	.....	2.5	5.6	.....	0.3	.....	.....

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\*Heat-treatment symbols have been omitted since composition does not vary for different heat-treatment practices.

†The Alclad form of these alloys consists of a "core" of the basis alloy coated with pure aluminum or a suitable alloy.

## ALUMINUM AND ITS ALLOYS (Continued)

### NOMINAL COMPOSITION OF CASTING ALLOYS<sup>1</sup>

Alloy	Per Cent of Alloying Elements — Aluminum and Normal Impurities Constitute Remainder				
	Copper	Silicon	Magnesium	Zinc	Nickel
99%	.....	.....	.....	.....	.....
13	.....	12.0	.....	.....	.....
43	.....	5.0	.....	.....	.....
85	4.0	5.0	.....	.....	.....
108	4.0	3.0	.....	.....	.....
112	7.0	.....	.....	1.7	.....
113	7.0	2.0	.....	1.7	.....
122	10.0	.....	0.2	.....	.....
142	4.0	.....	1.5	.....	2.0
195	4.5	0.8	.....	.....	.....
212	8.0	1.2	.....	.....	.....
214	.....	.....	3.8	.....	.....
B214	.....	1.8	3.8	.....	.....
F214	.....	0.5	3.8	.....	.....
218	.....	.....	8.0	.....	.....
220	.....	.....	10.0	.....	.....
319	3.5	6.3	.....	.....	.....
355	1.3	5.0	0.5	.....	.....
356	.....	7.0	0.3	.....	.....
360 <sup>2</sup>	.....	9.5	0.5	.....	.....
380 <sup>2</sup>	3.5	9.0	.....	.....	.....
384	3.8	12.0	.....	.....	.....
A612	0.5	.....	0.7	6.5	.....

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1. Heat-treatment symbols have been omitted since composition does not vary for different heat-treatment practices — see "Alcoa Aluminum and Its Alloys" for composition limits.
2. The alloys A360 and A380 have the same nominal compositions as 360 and 380, respectively, but the impurities, notably iron, are controlled to closer limits.

### NONHEAT-TREATABLE ALLOYS

#### 1100 and 3003

These alloys are commonly specified for applications that do not require high strength. In any given temper, 1100 forms slightly easier than 3003. However, because 3003 has greater strength, it is often used instead of 1100, even though minor changes in design and tools may be necessary to permit economical manufacture. Both 1100 and 3003 are used to manufacture drawn cooking utensils, bottles and glass closures, cosmetic containers, and other similar articles. The temper of 1100 or 3003 sheet may vary from "soft" to three-quarter hard, depending upon the depth of the draw. A half-hard temper is frequently specified.

#### 5052

5052 is stronger than 3003. In quarter-hard temper (5052-H32), it has good forming qualities. Its mechanical properties are, also, somewhat higher than 3003's in the hard-temper (3003-H). These factors, combined with an excellent resistance to corrosion and high endurance limit, make 5052 suitable for many applications which otherwise would require a heat-treatable alloy.

BRASS • COPPER

STAINLESS STEEL  
AND STEEL

MONEL-NICKEL

GENERAL



TYPICAL ① MECHANICAL PROPERTIES OF WROUGHT ALUMINUM ALLOYS

Alloy and Temper	Tensile Strength Lb./Sq. In.	Yield Strength (Offset = 0.2%), Lb./Sq. In.	Elongation Per Cent in 2 in.		Brinell Hardness, 500-kg. Load 10-mm Ball	Shearing Strength Lb./Sq. In.	Endurance Limit, <sup>②</sup> Lb./Sq. In.	
			Sheet Specimen ( <sup>1</sup> / <sub>16</sub> In. Thick)	Round Specimen ( <sup>1</sup> / <sub>2</sub> In. Diameter)				
99.6-O	10,000	4,000	43	.....	19	7,000	3,000	
99.6-H12	12,000	11,000	16	.....	23	8,000	4,000	
99.6-H14	14,000	13,000	12	.....	26	9,000	5,000	
99.6-H16	16,000	15,000	8	.....	30	10,000	6,500	
99.6-H18	19,000	18,000	6	.....	35	11,000	6,500	
EC-O	12,000	4,000		①	.....	.....	.....	
EC-H19	27,000	24,000		②	.....	.....	7,000	
1100-O	13,000	5,000	35	45	23	9,500	5,000	
1100-H12	15,500	14,000	12	25	28	10,000	6,000	
1100-H14	17,500	16,000	9	20	32	11,000	7,000	
1100-H16	20,000	18,000	6	17	38	12,000	8,500	
1100-H18	24,000	22,000	5	15	44	13,000	8,500	
3003-O	16,000	6,000	30	40	28	11,000	7,000	
3003-H12	19,000	17,000	10	20	35	12,000	8,000	
3003-H14	21,500	19,000	8	16	40	14,000	9,000	
3003-H16	25,000	22,000	5	14	47	15,000	9,500	
3003-H18	29,000	26,000	4	10	55	16,000	10,000	
ALCLAD 3003	PROPERTIES SUBSTANTIALLY SAME AS FOR 3003							
3004	26,000	10,000	20	25	45	16,000	14,000	

See footnotes, page 260.

See footnotes, page 260.

Continued on next page

## ALUMINUM AND ITS ALLOYS (Continued)

**TYPICAL ① MECHANICAL PROPERTIES OF WROUGHT ALUMINUM ALLOYS (Continued)**

Alloy and Temper	Tensile Strength Lb./Sq. In.	Yield Strength (Offset = 0.2%), Lb./Sq. In.	Elongation Per Cent in 2 In.		Brinell Hardness, 500-kg. Load 10-mm Ball	Shearing Strength Lb./Sq. In.	Endurance Limit, <sup>②</sup> Lb./Sq. In.
			Sheet Specimen ( $\frac{1}{16}$ In. Thick)	Round Specimen ( $\frac{1}{2}$ In. Diameter)			
3004-H32	31,000	22,000	10	17	52	17,000	14,500
3004-H34	34,000	27,000	9	12	63	18,000	15,000
3004-H36	37,000	31,000	5	9	70	20,000	15,500
3004-H38	40,000	34,000	5	6	77	21,000	16,000
ALCLAD 3004							
2011-T3 <sup>①</sup>	55,000	48,000	.....	15	95	32,000	18,000
2011-T6	57,000	39,000	.....	17	97	34,000	18,000
2011-T8	59,000	45,000	.....	12	100	35,000	18,000
2014-O	27,000	14,000	.....	18	45	18,000	13,000
2014-T4	62,000	40,000	.....	20	105	38,000	20,000
2014-T6	70,000	60,000	.....	13	135	42,000	18,000
ALCLAD 2014-O	25,000	10,000	21	.....	.....	18,000	.....
ALCLAD 2014-T3	63,000	40,000	20	.....	.....	37,000	.....
ALCLAD 2014-T4	61,000	37,000	22	.....	.....	37,000	.....
ALCLAD 2014-T6	68,000	60,000	11	.....	.....	41,000	.....
2017-O	26,000	10,000	.....	22	45	18,000	13,000
2017-T4	62,000	40,000	.....	22	105	38,000	18,000
2117	43,000	24,000	.....	27	70	28,000	13,500
2018-T61	61,000	46,000	.....	12	120	39,000	17,000

PROPERTIES SUBSTANTIALLY SAME AS FOR 3004

See footnotes, page 260.

Continued on next page

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STAINLESS STEEL  
AND STEEL

MONEL-NICKEL

GENERAL

## ALUMINUM AND ITS ALLOYS (Continued)

TYPICAL ① MECHANICAL PROPERTIES OF WROUGHT ALUMINUM ALLOYS (Continued)

Alloy and Temper	Tensile Strength Lb./Sq. In.	Yield Strength (Offset = 0.2%), Lb./Sq. In.	Elongation Per Cent in 2 in.		Brinell Hardness, 500-kg. Load 10-mm Ball	Shearing Strength Lb./Sq. In.	Endurance Limit <sup>②</sup> Lb./ Sq. In.
			Sheet Specimen ( $\frac{1}{16}$ In. Thick)	Round Specimen ( $\frac{1}{2}$ In. Diameter)			
2218-T72	48,000	37,000	.....	11	95	30,000	.....
2024-O	27,000	11,000	19	22	47	18,000	13,000
2024-T3	70,000	50,000	18	.....	120	41,000	20,000
2024-T4	68,000 <sup>③</sup>	48,000	20	19	120	41,000	20,000
2024-T36	72,000	57,000	14	.....	130	42,000	18,000
ALCLAD 2024-O	26,000	11,000	19	.....	.....	18,000	.....
ALCLAD 2024-T3	64,000	44,000	18	.....	.....	40,000	.....
ALCLAD 2024-T4	64,000	42,000	19	.....	.....	40,000	.....
ALCLAD 2024-T36	67,000	53,000	11	.....	.....	41,000	.....
ALCLAD 2024-T81	65,000	60,000	6	.....	.....	.....	.....
ALCLAD 2024-T86	70,000	66,000	6	.....	.....	.....	.....
2025-T6	58,000	37,000	.....	19	110	35,000	18,000
4032-T6	55,000	46,000	.....	9	120	38,000	16,000
5005-O	18,000	6,000	30	.....	28	11,000	.....
5005-H34	23,000	20,000	8	.....	41	14,000	.....
5050-O	21,000	8,000	24	.....	36	14,000	.....
5050-H32	24,500	21,000	9	.....	45	16,000	.....
5050-H34	27,500	24,000	8	.....	50	17,000	.....
5050-H36	29,500	26,000	7	.....	54	18,000	.....
5050-H38	31,000	28,000	6	.....	57	19,000	.....
6151-T6	48,000	43,000	.....	17	100	32,000	11,000

Continued on next page

See footnotes, page 260.



## ALUMINUM AND ITS ALLOYS (Continued)

TYPICAL ① MECHANICAL PROPERTIES OF WROUGHT ALUMINUM ALLOYS (Continued)

Alloy and Temper	Tensile Strength Lb./Sq. In.	Yield Strength (Offset = 0.2%), Lb./Sq. In.	Elongation Per Cent in 2 in.		Brinell Hardness, 500-kg. Load 10-mm Ball	Shearing Strength Lb./Sq. In.	Endurance Limit <sup>②</sup> Lb./ Sq. In.
			Sheet Specimen ( $\frac{1}{16}$ In. Thick)	Round Specimen ( $\frac{1}{2}$ In. Diameter)			
5052-O	27,000	12,000	25	30	45	18,000	17,000
5052-H32	34,000	27,000	12	18	62	20,000	17,500
5052-H34	37,000	31,000	10	14	67	21,000	18,000
5052-H36	39,000	34,000	8	10	74	23,000	18,500
5052-H38	41,000	36,000	7	8	85	24,000	19,000
6053-O	16,000	8,000	.....	35	26	11,000	8,000
6053-T4	30,000	20,000	.....	21	62	18,000	13,000
6053-T5	27,000	21,000	.....	15	60	17,000	.....
6053-T6	37,000	32,000	.....	13	80	23,000	13,000
5056-O	42,000	22,000	.....	35	.....	26,000	20,000
5056-H18	63,000	59,000	.....	10	.....	34,000	22,000
5056-H38	60,000	50,000	.....	15	.....	32,000	.....
6061-O	18,000	8,000	22	30	30	12,500	9,000
6061-T4	35,000	21,000	22	25	65	24,000	13,500
6061-T6	45,000	40,000	12	17	95	30,000	13,500
6062-O	17,000	6,500	.....	30	28	12,000	8,500
6062-T4	35,000	21,000	.....	25	65	24,000	13,500
6062-T6	45,000	40,000	.....	17	95	30,000	13,500
6063-T42	22,000	13,000	20	.....	42	14,000	9,500

See footnotes, page 260.

Continued on next page

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TYPICAL ① MECHANICAL PROPERTIES OF WROUGHT ALUMINUM ALLOYS (Continued)

Alloy and Temper	Tensile Strength Lb./Sq. In.	Yield Strength (Offset = 0.2%), Lb./Sq. In.	Elongation Per Cent in 2 in.		Brinell Hardness, 500-kg. Load 10-mm Ball	Shearing Strength Lb./Sq. In.	Endurance Limit <sup>②</sup> Lb./Sq. In.
			Sheet Specimen ( $\frac{1}{16}$ In. Thick)	Round Specimen ( $\frac{1}{2}$ In. Diameter)			
6063-T5	27,000	21,000	12	.....	60	17,000	9,500
6063-T6	35,000	31,000	12	.....	73	22,000	9,500
6063-T83	38,000	36,000	10	.....	82	.....	.....
6063-T831	32,000	29,000	10	.....	70	.....	.....
6063-T832	45,000	40,000	10	.....	95	.....	.....
6262-T9	58,000	55,000	.....	10	120	35,000	13,000
7075-O	33,000	15,000	17	16	60	22,000	.....
7075-T6 <sup>④</sup>	82,000	72,000	11	11	150	49,000	24,000
ALCLAD 7075-O	32,000	14,000	17	.....	.....	22,000	.....
ALCLAD 7075-T6	76,000	67,000	11	.....	.....	46,000	.....

① The values given in this table are averages which take into account the variations introduced by size, shape or method of manufacture. For guaranteed minimum values, see "Alcoa Aluminum and Its Alloys".

② Based on 500,000,000 cycles of completely reversed stress using the R. R. Moore type machine and specimen.

③ This material is commonly used in wire, sizes for which the typical elongation in 10 inches is about 23 per cent for EC-O and 1.5 per cent for EC-H19.

④ For sizes up to 1½ inches. For larger sizes, the strengths will be somewhat lower.

⑤ The strengths of extrusions more than about ¾ inch thick will be 15 to 20 per cent higher.

⑥ The values given are for sheet. Extrusions will have strengths about 8 to 10 per cent higher.

## ALUMINUM AND ITS ALLOYS (Continued)

### HEAT-TREATABLE ALLOYS

Heat-treatable alloys offer a wide range of properties to meet the many requirements of structural applications.

#### 2017

2017 is the oldest of the heat-treatable alloys. Although it has largely been replaced by 2024 in applications requiring strengths, it is still used in many cases where light weight is a factor, and a strength comparable to that of steel is sufficient.

#### 2024

2024 is similar to 2017 in composition and in many of its characteristics. But it is stronger. In fact, until the development of 7075, 2024 was the strongest aluminum alloy commercially available. 2024 is produced in practically all commercial forms. It is available, also, as an Alclad product in sheet and plate. Because of their high strengths, 2024 and Alclad 2024 are the principal alloys used in aircraft production.

#### 7075

7075 is a high-strength alloy. 7075-T6 (solution heat-treated and then artificially aged) has a very high tensile and yield strength, but cannot be formed as readily as 2024-T6. The workability of 7075-O (in the annealed condition) is as good as 2024-O. If 7075-T4 (solution heat-treated) is formed within a few days after quenching, it forms more easily than 2024-T4. And if the forming is delayed for a longer period of time, it still forms as easily as 2024-T4. 7075 can be heated for several hours at 350° F. to permit hot forming, without reducing its strength or resistance to corrosion. The endurance limit of 7075-T6 is the highest of any of the wrought aluminum alloys.

#### 6053 and 6061

Both 6053 and 6061 are characterized by moderately high strength, good formability and high resistance to corrosion. However, 6061 has slightly higher strength and somewhat better formability. As a result, 6061 is used more frequently and is commercially available in more commodities than 6053. Both alloys age harden to some extent at room temperature. But in the "solution heat-treated temper" (T4), they can take severe forming even after several weeks storage. Maximum strengths are reached by aging the heat-treated materials at an elevated temperature. Temper does not significantly affect the ability of either 6053 or 6061 to resist corrosive attack. Therefore, rapid quenching is not as important as with 2024 or 7075 (except as slow quenches may lower the properties). In addition, a modified heat-treatment to secure special combinations of properties can be used on either 6053 or 6061 without reducing their ability to resist corrosion.

#### 2011

2011 has very good "free-cutting" machining properties. Its other mechanical properties are comparable to 2017-T4. When produced in the modified heat treatment, 2011-T3 is excellent screw machine stock. Experience has proven the machining quality of this stock as being equal to that of the free-cutting alloys of other metals commonly used for automatic screw machines.

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## ALUMINUM AND ITS ALLOYS (Continued)

### ALCLAD PRODUCTS

Alclad is the name given to alloy products with an aluminum or an aluminum alloy surface which has been fused to, and made integral with, the base metal core.

In most cases, the purpose of the surface layer is to afford increased resistance to corrosion. The thickness of this surface layer is kept at the minimum required for adequate protection. As a result, the composite product retains the maximum of physical properties. For thick sheet and plate, the thickness of the surface layers is a smaller percentage of the total thickness than for thin sheets.

### TOOL AND JIG PLATE

Alcoa Tool and Jig Plate is cast. Both sides are machined. It is given stress relief treatment to assure dimensional stability for machining. Tool and Jig Plate is free of porosity, inclusions, blows and other injurious metallurgical defects.

### ADDITIONAL INFORMATION

The Aluminum Company of America has prepared many informative, technical booklets on aluminum and how to work it. This literature is free. To get copies, call or write our nearest warehouse or sales office, stating the type of information you want.

### TYPICAL PHYSICAL PROPERTIES OF WROUGHT ALLOYS

Alloy	Specific Gravity	Weight Lb. per Cu. In.	Approximate Melting Range, Degrees F.	Electrical Con-ductivity Per Cent of Inter-national Annealed Copper Standard	Thermal Con-ductivity at 25° C., C.G.S. Units
EC-O } EC-H19 }	2.70	0.098	1195-1215	62	0.56
1100-O } 1100-H18 }	2.71	0.098	1190-1215	{ 59 57	{ 0.53 0.52
3003-O } 3003-H18 }	2.73	0.099	1190-1210	{ 50 40	{ 0.46 0.37
3004-O } 3004-H38 }	2.72	0.098	1165-1205	{ 42 42	{ 0.39 0.39
2011-T3	2.82	0.102	995-1190	40	0.37
2014-O } 2014-T6 }	2.80	0.101	950-1180	{ 50 40	{ 0.46 0.37
2017-O } 2017-T4 }	2.79	0.101	955-1185	{ 45 30	{ 0.41 0.29

Continued on next page

# DATA

## ALUMINUM AND ITS ALLOYS (Continued)

### TYPICAL PHYSICAL PROPERTIES OF WROUGHT ALLOYS (Continued)

Alloy	Specific Gravity	Weight Lb. per Cu. In.	Approximate Melting Range, Degrees F.	Electrical Conductivity Per Cent of International Annealed Copper Standard	Thermal Conductivity at 25° C., C.G.S. Units
2117-T4	2.74	0.099	950-1200	40	0.37
2018-O 2018-T61	2.82	0.102	945-1180	{ 50 40	{ 0.46 0.37
2218-T72	2.80	0.101	1005-1170	44	0.41
2024-O 2024-T3	2.77	0.100	935-1180	{ 50 30	{ 0.45 0.29
2025-T6	2.79	0.101	970-1185	40	0.37
4032-O 4032-T6	2.69	0.097	990-1060	{ 40 35	{ 0.37 0.33
5005-O 5005-H38	2.70	0.098	1170-1205	52	0.48
5050-O 5050-H38	2.69	0.097	1160-1205	{ 50 50	{ 0.46 0.46
6151-O 6151-T4 6151-T6	2.70	0.098	1025-1200	{ 50 40 45	{ 0.46 0.37 0.41
5052-O 5052-H38	2.68	0.097	1100-1200	{ 35 35	{ 0.33 0.33
6053-O AND T5 6053-T4 AND T6	2.69	0.097	1075-1205	{ 45 40	{ 0.41 0.37
5056-O 5056-H18	2.64	0.095	1055-1180	{ 29 27	{ 0.28 0.26
6061-O 6061-T4 AND T6	2.70	0.098	1080-1205	{ 45 40	{ 0.41 0.37
6062-O 6062-T4 AND T6	2.70	0.098	1080-1205	{ .. 45	{ ..... 0.41
6063-T42 (FORMERLY "F") 6063-T5 AND T6	2.70	0.098	1140-1205	{ 50 55	{ 0.46 0.50
7075-O 7075-T6	2.80	0.101	890-1180	{ .. 30	{ ..... 0.29

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## ALUMINUM AND ITS ALLOYS (Continued)

### APPROXIMATE RADII FOR 90° COLD BEND ALUMINUM AND ALUMINUM ALLOY SHEET

Minimum permissible radius varies with nature of forming operation, type of forming equipment, and design and condition of tools. Minimum working radius for a given material or hardest alloy and temper for a given radius can be ascertained only by actual trial under contemplated conditions of fabrication.

Alloy and Temper	Bend Classification <sup>①</sup>	Alloy and Temper	Bend Classification <sup>①</sup>
1100-O	A	2024-O <sup>②</sup>	B
1100-H12	B	2024-T3 <sup>②③</sup>	J
1100-H14	B	2024-T36 <sup>②</sup>	K
1100-H16	D	5005-O	A
1100-H18	F	5005-H34	C
		5052-O	B
3003-O	A	5052-H32	C
3003-H12	B	5052-H34	D
3003-H14	C	5052-H36	F
3003-H16	E	5052-H38	G
3003-H18	G		
ALCLAD 2014-O	B	6061-O	B
ALCLAD 2014-T3 AND T4	H	6061-T4	E
ALCLAD 2014-T6	K	6061-T6	F
		7075-O	D
		7075-T6 <sup>②</sup>	K

① For corresponding bend radii, see following table.

② Alclad sheet can be bent over slightly smaller radii than the corresponding tempers of the uncoated alloy.

③ Immediately after quenching, this alloy can be formed over appreciably smaller radii.

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### RADII REQUIRED FOR 90° BEND IN TERMS OF THICKNESS,†

Bend Classification	Approximate Thickness, Inch					
	0.016 1/64	0.032 1/32	0.064 1/16	0.128 1/8	0.182 3/16	0.258 1/4
A	0	0	0	0	0	0
B	0	0	0	0	0-1†	0-1†
C	0	0	0	0-1†	0-1†	1/2†-1 1/2†
D	0	0	0-1†	1/2†-1 1/2†	1†-2†	1 1/2†-3†
E	0-1†	0-1†	1/2†-1 1/2†	1†-2†	1 1/2†-3†	2†-4†
F	0-1†	1/2†-1 1/2†	1†-2†	1 1/2†-3†	2†-4†	2†-4†
G	1/2†-1 1/2†	1†-2†	1 1/2†-3†	2†-4†	3†-5†	4†-6†
H	1†-2†	1 1/2†-3†	2†-4†	3†-5†	4†-6†	4†-6†
J	1 1/2†-3†	2†-4†	3†-5†	4†-6†	4†-6†	5†-7†
K	2†-4†	3†-5†	3†-5†	4†-6†	5†-7†	6†-10†

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## ALUMINUM AND ITS ALLOYS (Continued)

### CHEMICAL COMPOSITION LIMITS FOR WROUGHT ALLOYS<sup>(1)</sup> Composition in per cent; maximum unless shown as a range

Alloy	Aluminum	Copper	Iron	Silicon	Manganese	Magnesium	Zinc	Chromium	Nickel	Titanium	Other Elements	
											Each	Total
EC <sup>(2)</sup> 99.45% min. 99.6 Al 1100 99.0% min. 3003 Remainder		0.05 0.20 0.20	0.70 0.70 0.70	0.30 0.30 0.60	0.05 0.05 1.0-1.5		0.10 0.10				0.05 0.05 0.05	0.15 0.15 0.15
<b>3003 sheet or tubing coated with 7072 alloy<sup>(5)</sup></b>												
3004 Remainder		0.20	0.70	0.30	1.0-1.5	0.8-1.3	0.10				0.05	0.15
<b>3004 sheet coated with 7072 alloy<sup>(13)</sup></b>												
2011 2014 Remainder Remainder		5.0-6.0 3.9-5.0	0.70 1.0	0.40 0.5-1.2	0.4-1.2	0.2-0.8	0.30 0.25	0.10		0.15	0.05 0.05	0.15 <sup>(6)</sup> 0.15
<b>2014 sheet coated with 6053 alloy<sup>(7)</sup></b>												
2017 2018 2018 2018 2024 Remainder Remainder Remainder Remainder		3.5-4.5 2.2-3.0 3.5-4.5 3.5-4.5 3.8-4.9	1.0 1.0 1.0 0.85 0.50	0.80 0.80 0.90 0.45-0.9 0.50	0.4-1.0 0.20 0.20 0.20 0.3-0.9	0.2-0.8 0.2-0.5 0.45-0.9 1.3-1.8 1.2-1.8	0.10 0.10 0.25 0.25 0.10	0.10 0.10 0.10 0.10			0.05 0.05 0.05 0.05 0.05	0.15 0.15 0.15 0.15 0.15
See footnotes next page												

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# **CHEMICAL COMPOSITION LIMITS FOR WROUGHT ALLOYS<sup>①</sup> (Continued)** Composition in per cent; maximum unless shown as a range

Alloy	Aluminum	Copper	Iron	Silicon	Manganese	Magnesium	Zinc	Chromium	Nickel	Titanium	Other Elements	
											Each	Total
Alclad 2024												
2024 sheet coated with 99.3% min. aluminum <sup>⑧</sup>												
2025	Remainder	39-5.0	1.0	0.5-1.2	0.4-1.2	0.05	0.25	0.10	0.5-1.3	0.15	0.05	0.15
4032	Remainder	0.5-1.3	1.0	11.5-13.5	0.8-1.3	0.05	0.25	0.10	0.5-1.3	0.20	0.05	0.15
4043	Remainder	0.30	0.80	4.5-6.0	0.05	0.05	0.10	0.10	0.5-1.3	0.05	0.05	0.15
5005	Remainder	0.20	0.65	0.30	1.0-1.6	0.25	0.25	0.15-0.35	0.15	0.05	0.05	0.15
6151	Remainder	0.35	1.0	0.6-1.2	0.45-0.8	0.25	0.10	0.15-0.35	0.15	0.05	0.05	0.15
5052	Remainder	0.10	⑥	⑥	2.2-2.8	0.10	0.10	0.15-0.35	0.15	0.05	0.05	0.15
6053	Remainder	0.10	0.35	⑥	1.1-1.4	0.10	0.10	0.15-0.35	0.15	0.05	0.05	0.15
5056	Remainder	0.10	0.40	0.30	0.05-0.20	0.15	0.10	0.05-0.20	0.15	0.05	0.05	0.15
6061	Remainder	0.15-0.40	0.70	0.4-0.8	4.9-5.6	0.10	0.20	0.15-0.35	0.15	0.05	0.05	0.15
6062	Remainder	0.15-0.40	0.70	0.4-0.8	0.8-1.2	0.20	0.20	0.15-0.35	0.15	0.05	0.05	0.15
6063	Remainder	0.10	0.35	0.2-0.6	0.45-0.85	0.10	0.10	0.10	0.10	0.10	0.05	0.15
7072	Remainder	0.10	⑥	⑥	0.10	0.10	0.75-1.25	0.10	0.10	0.10	0.05	0.15
7075	Remainder	1.2-2.0	0.70	0.30	2.1-2.9	5.1-6.1	0.18-0.40	0.20	0.20	0.05	0.05	0.15

## **Alclad 7075**

## **7075 sheet coated with 7072 alloy<sup>②</sup>**

① Analysis is normally made only for those elements for which a specific range or limit is given in the table. If, however, the presence of other elements is indicated or suspected during the course of routine analysis, it should be determined that they are not present in amounts exceeding the limits prescribed in the last two columns. See pages 295 and 296 for nominal composition.

② Electrical conductor metal.

③ Iron plus silicon — 0.4 per cent maximum.

④ Iron plus silicon — 1.0 per cent maximum.

⑤ When sheet is coated on both sides, the coatings each are nominally 10 per cent of the total thickness; when coated on one side, the coating is nominally 15 per cent of the thickness when the thickness is less than 0.065 inch and 7½ per cent when the thickness is 0.065 inch or more. Tubing is coated only on the inside and the coating is nominally 10 per cent of the wall thickness.

⑥ Also contains 0.2-0.6 per cent, each, of lead and bismuth.

⑦ The coating on each side is nominally 10 per cent of the total thickness for sheet less than 0.040 inch thick and 5 per cent for sheet or plate 0.040 inch or more in thickness.

⑧ The coating is permitted to contain 0.7 per cent iron plus silicon, 0.1 per cent copper, 0.1 per cent zinc, 0.05 per cent manganese and traces of other elements. The coating on each side is nominally 5 per cent of the total thickness when the thickness is less than 0.064 inch and 2½ per cent when the thickness is 0.064 inch or more.

⑨ Iron plus silicon — 0.45 per cent maximum.

⑩ Silicon — 45 per cent to 65 per cent of magnesium.

⑪ Iron plus silicon — 0.6 per cent maximum.

⑫ The coating on each side is nominally 4 per cent of the total thickness.

⑬ The coating on each side is nominally 5 per cent of the total thickness.

## ALUMINUM AND ITS ALLOYS (Continued)

### WORKING CHARACTERISTICS OF ALCOA WROUGHT ALLOYS

Alcoa Alloy No.	Condition	Approx. Weight lb./cu. in.	Relative Resistance to Corrosion <sup>(1)</sup>	Relative Suitability for Being Cold-Worked <sup>(2)</sup>	Relative Machinability <sup>(3)</sup>	Relative Suitability for Being Brazed <sup>(4)</sup>	Relative Suitability for Being Welded <sup>(5)</sup>		
							Gas	Arc	Resistance Spot and Seam
1100-O	Annealed	.098	A	A+	B	A	A	A	B
1100-H18	Hard	.098	A	B-	B	A	A	A	B
3003-O	Annealed	.099	A	A+	B	A	A	A	A
3003-H18	Hard	.099	A	C+	B	A	A	A	A
Alclad 3003-O	Annealed	.099	A	A+	B	A	A	A	A
Alclad 3003-H18	Hard	.099	A	C+	B	A	A	A	A
3004-O	Annealed	.098	A	A+	B	B	A	A	A
3004-H38	Hard	.098	A	C+	B	B	A	A	A
2011-T3	Heat-treated	.102	D	C-	B	D	D	D	D
2011-T8	H. T. Cold-wkd. & Aged	.102	C*	D	A	D	D	D	D
2014-T4	Heat-treated	.101	C*	C-	A	D	D	D	B
2014-T6	H. T. & Aged	.101	C*	C-	A	D	D	D	B
Alclad 2014-T3 <sup>(3)</sup>	Heat-treated	.101	A	C	A	D	D	D	B
Alclad 2014-T6 <sup>(3)</sup>	H. T. & Aged	.101	A	C-	A	D	D	D	B
2017-T4	Heat-treated	.099	C*	C-	A	D	D	D	A
2117-T4	Heat-treated	.099	C	B-	A	D	D	D	A
2118-T61	H. T. & Aged	.102	C	C-	A	D	D	D	B
2024-T3	Heat-treated	.100	C*	C-	A	D	D	D	B
2024-T36	H. T. & Cold-wkd.	.100	C*	C+	A	D	D	D	B
Alclad 2024-T3 <sup>(3)</sup>	Heat-treated	.099	A	C+	A	D	D	D	B
Alclad 2024-T36 <sup>(3)</sup>	H. T. & Cold wkd.	.099	A	C-	A	D	D	D	B
4032-T6	H. T. & Aged	.097	C	C-	C	D	D	D	C
5050-O	Annealed	.097	A	A+	C	D	D	A	B
5050-H38	Hard	.097	A	C+	B	B	A	A	A

See footnotes next page

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## ALUMINUM AND ITS ALLOYS (Continued)

WORKING CHARACTERISTICS OF ALCOA WROUGHT ALLOYS (Continued)

Alcoa Alloy No.	Condition	Approx. Weight lb./cu. in.	Relative Resistance to Corrosion <sup>①</sup>	Relative Suitability for being Cold-Worked <sup>②</sup>	Relative Machinability <sup>③</sup>	Relative Suitability for being Brazed <sup>④</sup>	Relative Suitability for being Welded <sup>⑤</sup>		
							Gas	Arc	Resistance Spot and Seam
6151-T6	H. T. & Aged	.098	B	...	B	B	A	A	A
5052-O	Annealed	.097	A	A+	B	C	A	A	B
5052-H38	Hard	.097	A	C+	B	C	A	A	A
6053-T4	Heat-treated	.097	A	B-	B	A	A	A	A
6053-T6	H. T. & Aged	.097	A	C+	B	A	A	A	A
5154-O	Annealed	.100	A	B+	C	D	C	A	B
5154-H34	Hard	.100	A	B+	C	D	C	A	B
5154-H38	Hard	.100	A	B+	C	D	C	A	B
5056-O	Annealed	.095	A	A	B	D	C	A	A
5056-H38	Hard	.095	B	B-	B	D	C	A	B
6061-T4	Heat-treated	.098	A	B-	B	A	A	A	A
6061-T6	H. T. & Aged	.098	A	B-	B	A	A	A	A
6063-T5	Extruded & Aged	.098	A	B	B	A	A	A	A
7075-T6	H. T. & Aged	.101	C	D	A	D	D	D	B
Alclad 7075-T6	H. T. & Aged	.101	A	D+	A	D	D	D	B

① An "A" rating is highest. However, under many conditions, alloys rated "D" are used with entirely satisfactory results; on the other hand, alloys rated "A" require protection in some exposures.

② Relative hot and cold workability and machinability are indicated as follows: A=Excellent, B=Good, C=Fair, D=Poor. Ratings are based on aluminum-base alloys as a group and are not to be used in comparison with other metals.

③ Sheet over .064 in. thick will have slightly higher tensile and yield strengths.

④ For extrusions the strengths will be higher.

⑤ Weldability ratings A, B, C and D are relative ratings defined as follows:  
A. Easily weldable by all commercial procedures and methods.  
B. Weldable by specific technique or on specific applications, which justify preliminary trials or testing to develop welding procedure and weld performance.

C. Limited weldability because of crack sensitivity or loss in resistance to corrosion and mechanical properties.

D. No commonly used welding methods have so far been developed.

## COPPER AND ITS ALLOYS

**Copper** is relatively soft and ductile, and has a high electrical and thermal conductivity. It is available in all commercial forms, and is readily worked either hot or cold. Copper is highly corrosion resistant and is the base metal for many commercial alloys, of which brass is the best known.

**Spring Brass** is a special yellow brass, produced mainly for high-quality brass springs. It has high physical properties, and good corrosion resistance.

**Yellow Brass and Muntz Metal** are copper alloys with high zinc contents. All have good physical properties, and are economical alloys to use for many applications. However, under certain corrosive conditions they are subject to dezincification. They are also susceptible to corrosion cracking when subjected to high stresses under corrosive conditions. Free-cutting yellow brass is an alloy with a substantial percentage of lead added to improve its machining properties. This alloy is produced in rod form for screw machine work.

**Tobin Bronze\*** is a high zinc alloy, containing a small percentage of tin. It has high strength, fair corrosion resistance, good bearing qualities, and good resistance to erosion, and fair fatigue resistance. It is widely used for shafts, studs, and stay bolts.

**Extruded Architectural Bronze and Engravers Brass** are other high-zinc alloys. Engravers Brass is a leaded brass, produced in sheet form for operations that require special machining or cutting. Extruded Architectural Bronze is produced in many intricate extruded shapes for molding, frames, and decorative trim.

**Phosphor Bronze** alloys all have similar properties. They have high strength, good corrosion resistance, excellent bearing and spring properties, and good fatigue resistance. Among the Phosphor Bronze alloys, those with higher tin contents have higher physical properties. Phosphor Bronze is regularly used in the form of wire, sheet and strip (for making springs), and rod (for machining bushings and bearings). A free-cutting Phosphor Bronze is available for high-speed machining and screw machine work.

**18% Nickel Silver** is a silvery white alloy of copper, nickel, and zinc. It has good corrosion resistance and high physical properties. Yet, it is highly malleable and ductile, making it suitable for many types of forming operations.

**Additional Information.** All of the factors to be considered, and the problems likely to be encountered in selecting the proper alloy for specific applications, cannot be discussed here. However, the technical literature developed by the Technical Staff of the American Brass Company is available to you free of cost. Just call our nearest warehouse or sales office. We will be happy to furnish you with the information and literature you need.

**NOTE:** The tabulated values in the following tables are average and, because of manufacturing limitations, *should not be used for specification purposes*. Within manufacturing limitations and when so specified Anaconda products will be manufactured to applicable current ASTM specifications.

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BRASS • COPPER

STAINLESS STEEL  
AND STEEL

NA

MONEL-NICKEL

GENERAL

AHOMA

COPPER AND ITS ALLOYS  
(Continued)

## PHYSICAL PROPERTIES OF COPPER ALLOYS

Alloy	Form	Alloy No.		Tensile Strength lb. per sq. inch		Elongation % in 2 inch (unless other- wise noted)		Yield Strength @ 0.5% Elongation under Load lb. per sq. inch		Rockwell Hardness No.		
		Old	New	Hard (c)	Soft	Hard (c)	Soft	Hard (c)	Soft	Hard (c)	Soft	
<b>Coppers</b>												
Electrolytic Tough Pitch Phosphorized Boron Deoxidized Silver Bearing Silver Bearing Phosphorized Arsenical Tellurium Leaded	{Sheet Rod Wire	100	110	46,000 45,000 66,000	33,000 32,000 35,000	5 15 45	35 45 35(e)	40,000 40,000 40,000	10,000 10,000 10,000	B51 B50	F35 F35	
	{Tube Rod	103	122	45,000 1171	35,000 32,000	10 15	35(e) 45	40,000 40,000	10,000 10,000	B50 B50	F40 F35	
	{Sheet Rod	112	114	46,000 1114	33,000 32,000	5 5	35 35	40,000 40,000	10,000 10,000	B51 B51	F35 F35	
	{Sheet Tube	113	116	46,000 45,000	33,000 35,000	5 10	35 45	40,000 40,000	10,000 10,000	B51 B50	F35 F40	
	{Tube Rod	108	142	45,000 45,000	35,000 32,000	10 12	45 45	40,000 40,000	10,000 10,000	B50 B50	F40 F35	
	{Rod Rod	127	145	45,000 45,000	32,000 32,000	12 12	45 45	40,000 40,000	10,000 10,000	B50 B50	F35 F35	
	{Rod Rod	126	187	45,000 45,000	32,000 32,000	12 12	45 45	40,000 40,000	10,000 10,000	B50 B50	F35 F35	
	<b>Brasses</b>											
	Gilding Commercial Bronze Commercial Bronze Commercial Bronze Red Brass Red Brass Low Brass Low Brass Cartridge Brass Yellow Brass	{Sheet Sheet Wire	4	210	55,000 62,000 80,000	35,000 37,000 38,000	5 6 10	38 40 40(e)	44,000 47,000 47,000	11,000 12,000 13,000	B61 B70	F45 B1
{Wire Sheet Sheet		14	220	80,000 65,000 69,000	38,000 40,000 38,000	1(e) 6 7	40(e) 42 45	50,000 55,000 55,000	13,000 15,000 15,000	B73 B76	B3 B5	
{Sheet Wire Tube		21	226	69,000 88,000 89,000	40,000 42,000 40,000	6 10 10	42 42(e) 50	55,000 60,000 60,000	15,000 16,000 16,000	B76 B81	B5 B10	
{Wire Sheet Sheet		24	230	88,000 73,000 100,000	42,000 43,000 47,000	8 10 10	50 45(e) 65	60,000 62,000 62,000	16,000 17,000 17,000	B81 B83	B10 B20	
{Wire Sheet Tube		32	240	76,000 110,000 76,000	40,000 50,000 47,000	10 10 10	65 60 60	62,000 62,000 60,000	17,000 17,000 17,000	B83 B83	B20 B20	
{Tube Sheet Sheet		42	260	76,000 73,000 73,000	47,000 45,000 45,000	10 10 10	60 60 60	60,000 60,000 60,000	17,000 17,000 17,000	B80 B80	B15 B15	
{Sheet Sheet Sheet		59	268	73,000 73,000 73,000	45,000 45,000 45,000	10 10 10	60 60 60	60,000 60,000 60,000	17,000 17,000 17,000	B80 B80	B15 B15	

Continued on next page

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## COPPER AND ITS ALLOYS (Continued)

### PHYSICAL PROPERTIES OF COPPER ALLOYS (Continued)

Alloy	Form	Alloy No.		Tensile Strength		Elongation		Yield Strength		Rockwell Hardness	
				lb. per sq. inch		σ <sub>y</sub> in 2 inch (unless otherwise noted)		@ 0.5% Elongation under Load lb. per sq. inch		No.	
		Old	New	Hard (c)	Soft	Hard (c)	Soft	Hard (c)	Soft	Hard (c)	Soft
<b>Brasses (Continued)</b>											
Yellow Brass	Rod	61	274	65,000	46,000	20	60	50,000	17,000	B75	B20
	Wire			105,000	50,000	1(e)	50(e)				
Muntz Metal	Sheet	66	280		54,000		45		20,000		B45
Leaded Commercial Bronze	Sheet	201	310	62,000	37,000	6	40	47,000	12,000	B70	B1
Leaded Commercial Bronze	Rod	202	314	54,000	37,000	15	40	45,000	12,000	B58	B1
Hardware Bronze	Rod	267	320	52,000	40,000	20	45	43,000	15,000	B55	B5
Leaded Tube Brass	Tube	220	3301	73,000	45,000	10	55	60,000	17,000	B80	B15
Leaded Tube Brass	Tube	218	330	73,000	45,000	10	55	60,000	17,000	B80	B15
Free Cutting Tube Brass	Tube	282	332	73,000	45,000			60,000	17,000	B80	B15
Leaded Tube Brass	Tube	257	331	73,000	45,000	9	55	60,000	17,000	B80	B15
Threading Brass	Sheet	223	3302	73,000	45,000	10	55	60,000	17,000	B80	B15
Low-Leaded Brass	Sheet	226	335	73,000	45,000	9	55	60,000	17,000	B80	B15
Medium-Leaded Brass	Sheet	229	340	73,000	45,000	8	55	60,000	17,000	B80	B15
High-Leaded Brass	Sheet	235	342	73,000	45,000	8	52	60,000	17,000	B80	B15
Extra-High-Leaded Brass	Sheet	238	356	73,000	45,000	7	50	60,000	17,000	B80	B15
Free Cutting Brass	Rod	271	360	58,000	47,000	18	60	42,000	18,000	B70	B20
Free Cutting Brass Bar	Bar	262	3711	58,000	47,000	18	60	42,000	18,000	B70	B20
High-Leaded Brass	Sheet	243	353	73,000	45,000	7	50	60,000	17,000	B80	B15
Leaded Muntz Metal	Sheet	274	365		54,000		45		20,000		B45
Free Cutting Muntz Metal	Tube	393	371	80,000	54,000	6	40	60,000	20,000	B85	B45
Forging Brass	Rod	250	377		54,000		45		20,000		B45

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STAINLESS STEEL  
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NA

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COPPER AND ITS ALLOYS  
(Continued)

## PHYSICAL PROPERTIES OF COPPER ALLOYS (Continued)

Alloy	Form	Alloy No.		Tensile Strength lb. per sq. inch		Elongation % in 2 inch (unless other- wise noted)		Yield Strength @ 0.5% Elongation under Load lb. per sq. inch		Rockwell Hardness No.	
		Old	New	Hard (c)	Soft	Hard (c)	Soft	Hard (c)	Soft	Hard (c)	Soft
<b>Brasses (Continued)</b>											
Architectural Bronze	Rod	280	385	.....	60,000	.....	25	.....	.....	.....	B65
<b>Special Brasses</b>											
Ambronze	Sheet	474	—	60,000	40,000	6	40	50,000	15,000	B70	B5
High Strength Comm. Bronze	Rod	286	316	70,000	46,000	12	55	60,000	20,000	B80	B15
Ambronze	Tube	421	—	.....	.....	.....	.....	.....	.....	.....	.....
Manganese	Sheet	507	—	69,000	40,000	7	45	55,000	15,000	B76	B5
Red Brass	Sheet	1027	—	90,000	55,000	8	40	50,000	20,000	B90	B35
Silicon Red Brass	Sheet	435	—	80,000	48,000	10	60	.....	.....	.....	B25
Trumpet Brass	Tube	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ambrloy	Tube	927	—	85,000	52,000	10	65	60,000	20,000	B85	B30
(Aluminum Brass)	Sheet	.....	.....	48,000	.....	65	.....	.....	18,000	.....	B25
Arsenical Admiralty	Tube	439	—	85,000	52,000	10	65	.....	20,000	B30	B30
Manganese Brass	Sheet	510	667	76,000	47,000	10	65	62,000	17,000	B83	B20
Naval Brass	Sheet	450	—	56,000	56,000	.....	.....	.....	22,000	.....	B50
Naval Brass	Rod	450	—	63,000	56,000	30	40	35,000	22,000	B65	B50
Tobin Bronze*	Rod	452	—	63,000	56,000	35	45	35,000	22,000	B65	B50
Leaded Naval Brass	Rod	605	—	63,000	56,000	28	38	35,000	22,000	B65	B50
Leaded Naval Brass	Rod	612	—	63,000	56,000	25	35	35,000	22,000	B65	B50
Manganese Bronze	Rod	937	—	75,000	60,000	20	30	45,000	30,000	B85	.....

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## COPPER AND ITS ALLOYS (Continued)

### PHYSICAL PROPERTIES OF COPPER ALLOYS (Continued)

Alloy	Form	Alloy No.		Tensile Strength lb. per sq. inch		Elongation % in 2 inch (unless other- wise noted)		Yield Strength @ 0.5% Elongation under Load lb. per sq. inch		Rockwell Hardness No.	
		Old	New	Hard (c)	Soft	Hard (c)	Soft	Hard (c)	Soft		
<b>Aluminum Bronzes</b>											
Ambraloy	Sheet	901	—	92,000	55,000	7	65	65,000	22,000	B92	B35
	Rod			55,000	65	22,000	B35				
Ambraloy	Tube	928	—	60,000	60	65,000	25,000	B96	B50		
	Sheet			105,000	60	65,000	25,000	B50			
Avialite*	Rod	915	—	80,000	65	30	65	50,000	40,000		
	Rod			95,000	22	55,000	40,000				
Ambraloy	Plate	917	—	90,000	12	60,000		B105			
	Rod			105,000							
<b>Cadmium Bronzes</b>											
Hitenso*	Sheet	961	1622	55,000	37,000	6	50	48,000	12,000	B65	F47
	Wire			90,000	40,000	1(e)	40(e)				
Hitenso*	Wire	965	165	95,000	42,000	1(e)	40(e)				
<b>Copper Silicon Alloys</b>											
Everdur*	Sheet	1010	—	95,000	58,000	7	60	60,000	22,000	B92	B35
	Rod			90,000	58,000	18	70	60,000	22,000	B90	B35
Everdur*	Wire	1012	—	145,000	60,000	1(e)	50(e)	60,000		B90	F55
	Rod			90,000	18	46	50,000	15,000	B77	F55	
Everdur*	Sheet	1015	—	65,000	40,000	8	50	55,000	15,000	B80	F55
	Rod			70,000	15	40(e)	15,000				
Everdur*	Wire	1015	—	122,000	42,000	1(e)	40(e)	50,000	15,000	B75	F55
	Tube			40,000	8	50	53,000	B95			
Everdur*	Rod	1014	—	95,000	25						

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STAINLESS STEEL  
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MONEL-NICKEL

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ANA

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# COPPER AND ITS ALLOYS (Continued)

## PHYSICAL PROPERTIES OF COPPER ALLOYS (Continued)

Alloy	Form	Alloy No.		Tensile Strength lb. per sq. inch		Elongation % in 2 inch (unless other- wise noted)		Yield Strength @ 0.5% Elongation under Load lb. per sq. inch		Rockwell Hardness No.	
		Old	New	Hard (c)	Soft	Hard (c)	Soft	Hard (c)	Soft	Hard (c)	Soft
<b>Cupro Nickels</b>											
Cupro Nickel, 10%	Tube	755	706	60,000	44,000	15	46	57,000	22,000	B68	B25
	Sheet			77,000	55,000	5	40	70,000	22,000	B84	B35
	Rod			70,000	55,000	25	40	60,000	22,000	B80	B35
Cupro Nickel, 30%	Wire	702	715	95,000	58,000	1(e)	35(e)				
	Tube			70,000	55,000	10	45	60,000	22,000	B80	B35
<b>Nickel Silvers</b>											
Nickel Silver, 10%	Sheet	751	745	88,000	55,000	7	42	70,000	20,000	B87	B30
	Sheet			85,000	58,000	4	40	70,000		B85	B40
	Rod			70,000	58,000	20	45		22,000		
Nickel Silver, 18%	Wire	719	752	110,000	60,000	1(e)	40(e)				
	Sheet			99,000	60,000	4	45	75,000	22,000	B93	B45
Nickel Silver, 18%	Rod	724	770	80,000	60,000	20	45	60,000	22,000	B85	B45
	Wire			130,000	65,000	1(e)	40(e)				
Leaded Nickel Silver, 10%	Rod	825	796	70,000		15		40,000		B70	
<b>Special Alloys</b>											
Calsun Bronze*	Wire	951	---	135,000	52,000	1(e)	40(e)				
	Rod			62,000	35,000	20	40	57,000	15,000	B70	F50
	Chromium Copper	999	182	72,000	63,000	25	25	61,000	45,000	B77	B65
	Rod (f)										

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## COPPER AND ITS ALLOYS (Continued)

### PHYSICAL PROPERTIES OF COPPER ALLOYS (Continued)

Alloy	Form	Alloy No.		Tensile Strength lb. per sq. inch		Elongation % in 2 inch (unless other- wise noted)		Yield Strength @ 0.5% Elongation under Load lb. per sq. inch		Rockwell Hardness No.	
		Old	New	Hard (c)	Soft	Hard (c)	Soft	Hard (c)	Soft	Hard (c)	Soft
<b>Phosphor Bronzes</b>											
Phosphor Bronze	Sheet	356	505	65,000	40,000	6	48	50,000	14,000	B75	F60
Phosphor Bronze	Wire	361	507	105,000	45,000	1(e)	40(e)				
Phosphor Bronze	Sheet	(A)-302	5090	80,000	48,000	8	50	65,000	20,000	B86	B28
Phosphor Bronze	Rod	(A)-303	5091	65,000	48,000	30	50	55,000	20,000	B75	B28
Phosphor Bronze	Wire			110,000	52,000	1(e)	40(e)				
Phosphor Bronze	Rod	314	5092	65,000	48,000	30	50	55,000	20,000	B75	B28
Phosphor Bronze	Sheet	(A)-351	510	80,000	48,000	8	50	65,000	20,000	B86	B28
L. Phosphor Bronze	Rod	(B)-379	534	65,000	48,000	25	40	55,000	20,000	B75	B25
Phosphor Bronze	Wire	320	5181	120,000	57,000	1(e)	40(e)				
Phosphor Bronze	Sheet			93,000	60,000	10	65	68,000	24,000	B94	B50
Phosphor Bronze	Rod	(C)-353	521	80,000	60,000	30	65		24,000		
Phosphor Bronze	Wire			130,000	62,000	1(e)	40(e)				
Phosphor Bronze	Sheet			102,000	66,000	12	65	70,000	28,000	B98	B55
Phosphor Bronze	Rod	(D)-354	524	85,000	65,000	25	65				
Phosphor Bronze	Wire			145,000	68,000	1(e)	40(e)				
Free Cutting Phosphor Bronze	Rod	610	544	60,000		20		45,000		B75	

CODE

c—Hard Temper: values are for soft sheet that has been reduced about 37% in thickness by cold rolling and for Rod, Wire, and Tube of commercial hard drawn temper.

e—Elongation of wire, per cent in 10 inches.

f—Properties after heat treatment (alloy No. 999).

#### CODE

- c—Hard Temper; values are for soft sheet that has been reduced about 37% in thickness by cold rolling and for Rod, Wire, and Tube of commercial hard drawn temper.  
e—Elongation of wire, per cent in 10 inches.  
f—Properties after heat treatment (alloy No. 999).

STAINLESS STEEL  
AND STEEL

MONEL-NICKEL

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NA

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COPPER AND ITS ALLOYS  
(Continued)

## CHEMICAL COMPOSITION OF ALLOYS

Name	Alloy No.		Nominal Composition, per cent						Others
	Old	New	Copper	Zinc	Tin	Lead	Aluminum	Phosphorus	Manganese
<b>Coppers</b>									
Electrolytic Tough Pitch	100	110	99.9+	.....	.....	.....	.....	.....	.....
Deoxidized	103	122	99.9+	.....	.....	.....	.....	0.02	.....
Tellurium	127	145	99.50	.....	.....	.....	.....	.....	Tellurium, 0.50
Leaded	126	187	99.00	.....	.....	1.00	.....	.....	.....
<b>Brasses</b>									
Commercial Bronze	14	220	90.00	10.00	.....	.....	.....	.....	.....
Red Brass	24	230	85.00	15.00	.....	.....	.....	.....	.....
Low Brass	32	240	80.00	20.00	.....	.....	.....	.....	.....
Cartridge Brass	42	260	70.00	30.00	.....	.....	.....	.....	.....
Yellow Brass	59	268	66.00	34.00	.....	.....	.....	.....	.....
Yellow Brass	61	274	63.00	37.00	.....	.....	.....	.....	.....
Muntz Metal	66	280	60.00	40.00	.....	.....	.....	.....	.....
<b>Leaded Brasses</b>									
Leaded Commercial Bronze	201	310	90.00	9.50	.....	0.50	.....	.....	.....
Leaded Commercial Bronze	202	314	88.50	9.25	.....	2.25	.....	.....	.....
Leaded Tube Brass	218	330	66.50	33.00	.....	0.50	.....	.....	.....
Free Cutting Brass	271	360	61.50 <sup>1</sup>	35.25	.....	3.25	.....	.....	.....
Clock Brass	243	353	61.50	37.00	.....	1.50	.....	.....	.....
Extruded Architectural Bronze	280	385	56.00	41.50	.....	2.50	.....	.....	.....

Continued on next page



## COPPER AND ITS ALLOYS (Continued)

### CHEMICAL COMPOSITION OF ALLOYS (Continued)

Name	Alloy No.		Nominal Composition, per cent								Others
	Old	New	Copper	Zinc	Tin	Lead	Aluminum	Phosphorus	Manganese		
<b>Special Brasses</b>											
Ambraloy (Aluminum Brass)	927	—	77.00	20.96	—	—	2.00	—	—	Arsenic, 0.04	
Arsenic Admiralty	439	—	71.00	27.96	1.00	—	—	—	—	Arsenic, 0.04	
Naval Brass	450	—	60.00	39.25	0.75	—	—	—	—	—	
Tobin Bronze*	452	—	60.00	39.25	0.75	—	—	—	—	—	
Leaded Naval Brass	605	—	60.00	38.55	0.75	0.70	—	—	—	—	
Leaded Naval Brass	612	—	60.00	37.50	0.75	1.75	—	—	—	—	
Manganese Bronze	937	—	58.50	39.25	1.00	—	—	—	0.25	Iron, 1.00	
<b>Phosphor Bronzes</b>											
Phosphor Bronze, 5% (Grade A)	351	510	94.75	—	5.00	—	—	0.25	—	—	
Phosphor Bronze, 10% (Grade D)	354	524	89.75	—	10.00	—	—	0.25	—	—	
Free Cutting Phosphor Bronze	610	544	87.90	4.00	4.00	4.00	—	0.10	—	—	
<b>Aluminum Bronzes</b>											
Ambraloy	901	—	95.00	—	—	—	5.00	—	—	—	
Ambraloy	928	—	92.00	—	—	—	8.00	—	—	Nickel, 0.50	
Avialite*	915	—	89.25	—	0.40	—	9.25	—	—	Iron, 0.60	
Ambraloy	917	—	82.00	—	—	—	9.50	—	1.00	Nickel, 5.00	
										Iron, 2.50	

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GENERAL

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DATA

COPPER AND ITS ALLOYS  
(Continued)

## CHEMICAL COMPOSITION OF ALLOYS (Continued)

Name	Alloy No.		Nominal Composition, per cent								Others	
	Old	New	Copper	Zinc	Tin	Lead	Aluminum	Phosphorus	Manganese			
<b>Copper-Silicon Alloys</b>												
Everdur*	1010	—	95.80	—	—	—	—	—	—	1.10	Silicon,	3.10
Everdur*	1012	—	95.60	—	—	0.40	—	—	—	1.00	Silicon,	3.00
Everdur*	1014	—	90.75	—	—	—	—	7.25	—	—	Silicon,	2.00
Everdur*	1015	—	98.25	—	—	—	—	—	—	0.25	Silicon,	1.50
<b>Cupro Nickels</b>												
Cupro Nickel, 10%	755	706	88.35	—	—	—	—	—	—	0.40	Nickel, Iron,	10.00 1.25
Cupro Nickel, 30%	702	715	68.90	—	—	—	—	—	—	0.60	Nickel, Iron,	30.00 0.50
<b>Nickel Silvers</b>												
Nickel Silver, 10%	751	745	66.00	24.00	—	—	—	—	—	—	Nickel,	10.00
Nickel Silver, 18%	719	752	64.50	17.50	—	—	—	—	—	—	Nickel,	18.00
Nickel Silver, 18%	724	770	55.00	27.00	—	—	—	—	—	—	Nickel,	18.00
Ambrac*	850	7321	75.00	5.00	—	—	—	—	—	—	Nickel,	20.00

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\*Trade Mark Reg. U. S. Pat. Off.

# DATA

## COPPER-BASE TUBE ALLOY FOR STATIONARY POWER AND MARINE APPLICATIONS

Where Used	Tube Alloys
Air Cooled Heat Exchangers	Copper, Finned Admiralty or Copper Admiralty, etc.
Auxiliary Steam Evaporators	Admiralty, Cupro Nickel
Boiler Blowdown Heat Exchangers	Admiralty, Cupro Nickel
Boiler Feed Make-up Water Evaporators	Admiralty, Copper, Red Brass, etc.
Compressed Air Coolers	Copper Admiralty, Copper, etc.
Compressed Air Lines	Admiralty, Copper, etc.
Condensate Coolers	Admiralty, Copper, etc.
Diesel Lubricating Oil Coolers	Admiralty
Diesel Jacket Water Coolers	Admiralty, Copper, Red Brass, etc.
Economizers	Admiralty, Aluminum Brass, Duronze IV, 70-30 Cupro Nickel, etc.
Evaporators	Admiralty, Aluminum Brass, Duplex
Evaporator Condenser	Admiralty, Copper, Cupro Nickel, etc.
Exhaust Gas Water Heaters	Copper, Admiralty, etc.
Feed Water Heaters	Copper, Admiralty, Red Brass, etc.
Fuel Oil Heaters	Admiralty, 70-30 Cupro Nickel, etc.
Fuel Oil Lines	Admiralty, Copper, etc.
Generator Air Coolers	Copper, 2% Silicon Bronze, etc.
Gland Steam Condensers	Admiralty, 70-30 Cupro Nickel, Aluminum Brass, etc.
Hydraulic Pressure Lines	Copper, 2% Silicon Bronze
Hydrogen Coolers	Admiralty, etc.
Instrument Tubing	Admiralty, Red Brass, Copper, etc.
Intercoolers and Aftercoolers	Admiralty, Copper, Duplex Tubes, etc.
Lubricating Oil Coolers	Admiralty, Aluminum Brass, Muntz Metal, Duronze IV, Copper, 70-30 Cupro Nickel, etc.
Refrigeration or Cooling Equipment	Copper, Admiralty, Muntz Metal, etc.
Steam Condensers-Main or Auxiliary	Admiralty, Aluminum Brass, Duronze IV, 70-30 Cupro Nickel
Tank Suction Oil Heaters	Copper, Admiralty
Turbine Oil Coolers	Admiralty, Red Brass, etc.
Unit Heaters and Coolers	Copper, Admiralty, Red Brass, etc.
Vent Condensers	Copper, Admiralty, Red Brass, etc.
Water Heaters	Copper, Admiralty, Red Brass, Duplex
Waste Water Heat Exchangers	Copper, Red Brass.
Water Lines	

STAINLESS STEEL  
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## STAINLESS ANALYSES

Groups	AISI Type	Chromium
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### Chromium-Nickel, Non-Hardenable Grades (Austenitic)

This group is made up of alloys containing nickel (6.0 to 22.0%) as well as chromium (16.0 to 26.0%) as the chief alloying elements. Other elements such as molybdenum, titanium, and columbium may also be present to confer special corrosion properties. Except for surface hardening, these alloys cannot be hardened by heat-treatment, but they can be appreciably hardened to varying degrees by cold-working. They are non-magnetic unless severely cold-worked. When annealed, their structure is composed primarily of the micro-constituent austenite, and they are therefore referred to as "austenitic" stainless steels.

301	16.0-18.0
302	17.0-19.0
303	17.0-19.0
304	18.0-20.0
308	19.0-21.0
309	22.0-24.0
310	24.0-26.0
316	16.0-18.0
321	17.0-19.0
347	17.0-19.0

### New Stainless Steel Type (Austenitic Group)

AISI assigned symbol D319 to a new stainless steel type which is sponsored by the Chemical Industry Advisory Board. It is expected that the new type will eventually replace both Types 316 and 317 among chemical processing equipment manufacturers.

D319	17.5-19.5
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Analysis shows that it has a very close relationship to Type 317 in chromium and nickel content, and is comparable to Type 317 in molybdenum content.  
(D signifies development)

### Straight Chromium, Hardenable Grades (Martensitic)

This group includes those grades which have chromium as their chief alloying ingredient (from 11.5 to 18.0%) and with varying amounts of carbon, from approximately .08 to 1.10%. Nickel is present in Type 414 and Type 431, up to 2.50% but is not included in other alloys of this group as a principal alloying element. Each of these grades can be hardened to a high degree by quenching from high temperatures. They respond to heat treatment much the same as plain carbon and low alloy steels. They are magnetic. Because, when hardened, their crystalline structure is composed primarily of the micro-constituent martensite, they are commonly referred to as the "martensitic" stainless steels.

403	11.5-13.5
410	11.5-13.5
414	11.5-13.5
416	12.0-14.0
420	12.0-14.0
431	15.0-17.0
440A	16.0-18.0
440B	16.0-18.0
440C	16.0-18.0

NOTE: Types 420F and 440F have same compositions as 420 and 440C with addition of "free machining" element.

# DATA

Nickel	Carbon	Man- ganese Max.	Sil- icon Max.	Phos- phorus Max.	Sul- phur Max.	Other Elements
6.0- 8.0	OVER .08-20	2.00	1.00	.04	.04	.....
8.0-10.0	OVER .08-20	2.00	1.00	.04	.04	.....
8.0-10.0	.20 MAX.	2.00	1.00	*	*	.....
8.0-10.0	.08 MAX.	2.00	1.00	.04	.04	.....
10.0-12.0	.08 MAX.	2.00	1.00	.04	.04	.....
12.0-15.0	.20 MAX.	2.00	1.00	.04	.04	.....
19.0-22.0	.25 MAX.	2.00	1.50	.04	.04	.....
10.0-14.0	.10 MAX.	2.00	1.00	.04	.04	MO 1.75-2.50
8.0-11.0	.10 MAX.	2.00	1.00	.04	.04	TI 4XC MIN.
9.0-12.0	.10 MAX.	2.00	1.00	.04	.04	CB 8XC MIN.

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11.0-15.0 .07 MAX. 2.00 1.00 .045 .030 MO 2.25-3.00

.....	.15 MAX.	1.00	1.00	.04	.04	.....
.....	.15 MAX.	1.00	1.00	.04	.04	.....
1.25-2.50	.15 MAX.	1.00	1.00	.04	.04	.....
.....	.15 MAX.	1.00	1.00	.04	†	.....
.....	.15 MIN.†	1.00	1.00	.04	.04	.....
1.25-2.50	.20 MAX.	1.00	1.00	.04	.04	.....
.....	.60-.75	1.00	1.00	.04	.04	MO .75 MAX.
.....	.75-.95	1.00	1.00	.04	.04	MO .75 MAX.
.....	.95-1.10	1.00	1.00	.04	.04	MO .75 MAX.

\*P, S or SE — Usual Range Either .18/.35 S and .04 P or .18/35 SE and .12/.17 P. †Usual Range .18/.35. ‡Usual Range .35/.45.

Continued on next page

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## STAINLESS ANALYSES (Continued)

Groups	AISI Type	Chromium
--------	-----------	----------

### Straight Chromium, Non-Hardenable Grades (Ferritic)

This group is made up of alloys also containing chromium as the chief alloying element (from 14.0 to 27.0%) and with generally low carbon contents (from about .08 to .20%). Nickel is present in these alloys only as traces. Principally because of their higher chromium contents, as well as lower carbon contents, these alloys do not harden to any appreciable extent when quenched from high temperatures. They are also magnetic. When annealed, their crystalline structure is composed primarily of the micro-constituent alpha ferrite. Accordingly, they are referred to as "ferritic" stainless steels.

430	14.0-18.0
430F	14.0-18.0
442	18.0-23.0
446	23.0-27.0

### Precipitation-Hardening

This group has low hardening temperatures that avert problems of scaling, distortion, and cracking. Armco 17-7 PH is hardened by heat-treatment in the range of 900° F. to 1050° F. after suitable austenite conditioning and transformation to martensite. Armco 17-4 PH is hardened at 900° F. to 1150° F. by a single heat treatment. No stress-relief treatment is required. Armco PH 15-7 Mo is a new higher strength grade similar in composition and structure to 17-7 PH. Molybdenum is added to increase its mechanical properties at temperatures up to 1000° F. These precipitation-hardening grades are commercially available in all forms, can be hardened by simple heat treatments, are readily fabricated by standard methods, resist corrosion without plating or painting and possess high strength-weight ratios up to 900°-1000° F.

17-7PH	17.00
17-4PH	16.50
PH 15-7 MO	14.0-16.0

### ELC Grades

The extra low carbon grades contain a maximum of only 0.03 per cent carbon. This amount of carbon is low enough to eliminate carbide precipitation adjacent to welds during the welding operation. The ELC grades are not recommended for use at high temperature.

304L	18.0-20.0
316L	16.0-18.0



# DATA

Nickel	Carbon	Man- ganese Max.	Sil- icon Max.	Phos- phorus Max.	Sul- phur Max.	Other Elements
--------	--------	------------------------	----------------------	-------------------------	----------------------	-------------------

.....	.12 MAX.	1.00	1.00	.04	.04	.....
.....	.12 MAX.	1.00	1.00	.04	§	.....
.....	.35 MAX.	1.00	1.00	.04	.04	.....
.....	.35 MAX.	1.00	1.00	.04	.04	.....

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7.00	.07	.....	.....	.....	.....	AL 1.10
3.50	.04	.....	.....	.....	.....	CU 3.50
6.50-7.75	.09	1.00	1.00	.04	.04	{ MO 2.00-3.00 AL 0.75-1.50

8.0-12.0	.03 MAX.	.....	.....	.....	.....	.....
10.0-14.0	.03 MAX.	.....	.....	.....	.....	MO 2.0-3.0

§.07 Min. Usual Range .18/.35

**STAINLESS ANALYSES**  
(Continued)**Type 301**

This typical austenitic alloy can be used in place of 18-8 alloys in some cases when the application does not require as high corrosion resistance and drawing and forming properties as the 18-8 alloys possess. Its chief advantages over 18-8 grades are its greater stiffness and tensile strength, and its lower cost in sheet and strip form.

Type 301 is especially satisfactory for such products as cream separator discs, flatware, trays, novelties, bar equipment, and decorative applications.

**Type 302**  
**18-8**

Essentially this is the basic grade and the most commonly used of all the chromium-nickel stainless steels. It retains an untarnished silvery surface under atmospheric conditions and has excellent heat oxidation resistance up to approximately 1600° F. In the annealed condition it is non-magnetic. Although it cannot be hardened by heat treatment its hardness and tensile strength may be considerably increased by cold working.

Because of its great ductility and exceptional toughness, it can be severely drawn, spun, rolled, machined or otherwise worked in the cold state. Its welding properties are outstanding.

Type 302 is widely used for hotel, restaurant and dairy equipment. It will withstand most of the corrosive solutions encountered in the textile, paper, chemical, processing and food handling industries.

**Type 303**  
**18-8 Free Machining**

Type 303 is similar in mechanical, physical, and corrosion-resisting properties to Type 302. It contains an addition of sulphur or selenium and phosphorus to improve machinability.

While Type 302 may be machined at speeds up to about 45%, Type 303 can be used at speeds over 75% of those employed for Bessemer screw stock. Like Type 302 it is non-magnetic unless work hardened.

**Type 304**  
**18-8 Low Carbon**

This grade is similar to Type 302 except that a maximum carbon content of .08% is guaranteed. The lower carbon content was developed to minimize susceptibility to intergranular corrosion which may result from the carbon separation that takes place in high carbon 18-8 alloys when the metal is heated within the temperature range of 900° F.-1650° F. In welding, this temperature gradient is always encountered a slight distance on each side of the weld, in which area carbide separation takes place.

Type 304 is especially recommended for welded construction where severe corrosive conditions are encountered, such as in the dairy, chemical, paper and textile industries. This low carbon grade is not ordinarily required for welded construction subjected only to atmospheric conditions.

## STAINLESS ANALYSES (Continued)

### Types 304L and 316L Extra Low Carbon

Armco 18-8 ELC (Type 304L) and 18-12 Mo ELC (Type 316L) are extra low carbon alloys that offer better corrosion resistance adjacent to welds. These alloys contain a maximum of only 0.03 per cent carbon. This amount of carbon is small enough to eliminate harmful carbide precipitation adjacent to welds during the welding operation.

These extra low carbon grades are recommended only for welded equipment made for service below the lower sensitizing temperature of 800° F. — especially when corrosive conditions are severe. They are not recommended for use at high temperature.

It is not necessary to anneal welds made with the ELC types, except when specifications call for stress-relieved welds. Both 304L and 316L grades can be highly polished with no surface blemishes.

### Type 309 25-12

This chromium-nickel alloy resists destructive heat scaling at temperatures as high as 2000° F. It retains considerable strength and toughness at elevated temperatures, is ductile, workable, easily welded, machinable, and has excellent corrosion resistance.

Type 309 is widely used for annealing furnace inner covers, kiln linings, furnace parts, linings and supports, oil and gas combustion chambers, regenerative and recuperative preheaters.

### Type 316 18-12 Mo

This chromium-nickel alloy has a low carbon and high nickel content, and contains 2 to 4% molybdenum. Its corrosion resistance is somewhat better than chromium-nickel grades without molybdenum — particularly in reducing acid environment. The molybdenum tends to increase passivity, improves the alloy's corrosion resistance in general, and helps minimize pitting or pin hole corrosion under certain conditions. This grade has good creep strength at elevated temperatures.

Type 316 is used principally in the textile, paper, and chemical industries, especially where sulphite or various dye and bleaching solutions are present.

### Types 321 and 347 18-8 Stabilized

When ordinary chromium-nickel stainless steels are heated within the range of 900° to 1600° F. as the result of welding, heating in fabrication, or heating in service, the areas subjected to these high temperatures undergo a change in structure. This change, called "carbide precipitation", involves the migration of carbon to the grain boundaries where it combines with chromium to form chromium carbides. This depletion of chromium within the grain boundaries results in a loss of corrosion resistance.

*Continued on next page*

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**STAINLESS ANALYSES  
(Continued)****Types 321 and 347****18-8 Stabilized (Continued)**

The Titanium in Type 321 and the Columbium in Type 347 are strong carbide-forming elements. Because they combine with carbon more readily than does chromium, they minimize the formation of chromium carbides, thus leaving the chromium in solution. In this condition it has the most beneficial effect on corrosion resistance.

Type 321 and 347 are used principally for welded equipment which cannot be annealed and quenched after welding, and where service conditions are too severe to permit the use of low carbon 18-8 stainless steels. They are also used in welded equipment which must undergo a stress relieving anneal. These grades are suitable for equipment used in the 900°-1600° F. critical range of carbide precipitation.

**Type 410****12 Chromium**

This straight chromium magnetic grade can be hardened by heat treatment up to 400 Brinell. It has good creep strength and is extensively used for cold-headed screws, bolts, rods, pistons and valve parts operating at temperatures up to 850° F. Although Type 410 may stain, it will resist progressive corrosion from steam, carbonic acid, crude oil, blood, perspiration and ammonia.

Foundry flasks, cutlery, coal sizing screens, conveyor parts, coal and coke chutes, and furnace or stove parts where temperatures do not exceed about 1250° F. are a few successful applications of Type 410.

**Type 416****12 Chromium Free Machining**

This is a free machining grade with properties and corrosion resistance similar to those of Type 410. Because of its high sulphur content it can be machined at speeds approaching 85% of those used for Bessemer screw stock. Type 416 has become one of the most widely used stainless steels because it can be machined at high rates and it often can be placed in service in the "as machined condition" without heat treatment.

**Type 420****13 Chromium .35 Carbon**

This alloy, capable of heat treatment to high hardness, is used for cutlery, dental and surgical instruments, bearings and similar applications. As is the case with the other high-carbon grades, the corrosion resistance of Type 420 is best when it is in the hardened and stress relieved condition. In this condition it will have a hardness range of 470-530 Brinell. Type 420 can be machined at 45% of the speeds used for Bessemer screw stock.

## STAINLESS ANALYSES (Continued)

### **Type 430** **14-18 Chromium**

This high chromium, low carbon stainless steel has good mechanical and physical properties, good corrosion resistance to many dilute organic acids and very dilute salt solutions, and has excellent resistance to nitric acid. It withstands destructive heat scaling up to about 1550° F.

Type 430 when welded is susceptible to grain growth with some loss in ductility and toughness. For this reason it is not recommended for welded sections which will be exposed to shock or vibration in service.

Because of its strength, toughness, and resistance to heat oxidation, as well as chemical and atmospheric corrosion, Type 430 is used in range oil burners, heat exchanger flues, oil and gas furnace combustion chambers, and annealing furnaces.

### **Type 430 F** **14-18 Chromium Free Machining**

This grade combines the high corrosion resistance of Type 430 with the excellent free machining qualities of Type 416. It is well suited for use in automatic screw machines and it may be machined at speeds better than 85% of those used for Bessemer screw stock. The properties are similar to those of Type 430 except that the good cold-forming capacity of Type 430 is sacrificed for machinability.

Although it has not been in commercial production as long as Type 416, the combination of higher corrosion and heat resistance, and excellent machinability of Type 430F has greatly extended its use when hardening or heat treatment is not required. It will not discolor in ordinary atmospheres and is therefore widely used for products which must remain bright under relatively severe conditions.

### **Type 440 A, B, C,** **17 Chromium High Carbon**

These three high carbon grades have progressively higher carbon contents. In the hardened and strain-relieved condition Type 440-A has a hardness range of 500 to 560 Brinell, Type 440-B from 520 to 590 Brinell, Type 440-C from 540 to 620 Brinell.

These alloys are used for applications where the highest physicals as well as excellent corrosion resistance are needed. Solenoid valves, abrasion resisting nozzles, high grade cutlery, are made from these grades.

### **Type 446** **23-27 Chromium**

This non-hardenable, straight chromium alloy has excellent corrosion resistance as well as the ability to withstand destructive heat scaling under oxidizing conditions at temperatures as high as 2100° F. Although slightly superior to Type 309 in resistance to oxidation, Type 446 is not as strong or ductile, nor are its welding characteristics as good. Type 446 has been used successfully under carburizing conditions.

Typical applications are furnace floor plates and oil burner combustion chambers and target plates.

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## STAINLESS ANALYSES (Continued)

### Type 17-4 PH and 17-7 PH

#### 16.00 — 17.00 Chromium

These precipitation-hardening stainless steels have corrosion resistance surpassing that of the best hardenable standard stainless steels, and in some conditions equal to that of 18-8. They can be deep drawn and severely formed. They have yield strengths in tension and compression, and high tensile strengths.

Both 17-4 PH and 17-7 PH have low hardening temperatures that avert problems of scaling, distortion, and cracking. 17-7 PH is hardened by high heat in the range of 900° F. — 1400° F. 17-4 PH is hardened at 850° F. — 1150° F.

Both alloys have excellent welding characteristics, and are machinable in the annealed or solution-treated conditions, and in the hardened condition.

### Type PH 15-7 MO

#### 14.00-16.00 Chromium

This precipitation-hardening stainless steel is a new and higher strength alloy possessing an outstanding combination of room temperature and elevated temperature mechanical properties. Molybdenum is added to increase its mechanical properties over 17-7 PH at temperatures up to 1000° F.

Supplied in a wide range of sheet, strip, plate bar and wire forms, this alloy provides similar transforming and hardening characteristics to 17-7 PH during heat treatment.

### Type 17-14 CU-MO

Armco 17-14 Cu-Mo Stainless Steel is a special high temperature alloy economical in price and fabrication, and outstanding in high-stress, long-time service at temperatures up to 1500° F.

This alloy was developed to supply the needs of manufacturers of aircraft, gas turbines, high temperature steam turbines, boilers, superheaters, petroleum cracking stills, reaction vessels, fasteners, and other such high temperature equipment.

### Type 17-10 P

Armco 17-10 P is one of the newest stainless steel grades. It was developed for use in applications requiring high strength with low magnetic permeability.

The principal use for this new grade is in naval programs where the combination of strength and low magnetic permeability is a necessity. The nearest competitive materials are alloys that contain large percentages of extremely critical elements. Armco 17-10 P has been used as a substitute for "K" Monel and beryllium copper with a considerable saving in cost and critical elements. Competitively priced common materials are only about half as strong while comparable alloys in strength are either too expensive or too high in critical elements, or both.

This grade is a precipitation-hardening grade and is one of the chromium-nickel stainless steels that hardens by heat treatment.



# DATA

## STAINLESS FINISHES

### STAINLESS STEEL SHEET, BAR, AND PLATE FINISHES

Finish	Name	Description	Sheet	Plate	Bar
HR	HOT ROLLED	DARK OXIDE FINISH		X	
HRA	HOT ROLLED, ANNEALED	DARK OXIDE FINISH		X	X
NO. 1	HOT ROLLED, ANNEALED PICKLED	WHITE PICKLED FINISH	X	X	X
NO. 2D	DULL FULL COLD DRAWN FINISH	SMOOTH, DULL, COLD-ROLLED FINISH			X
NO. 2B	BRIGHT FULL FINISH	SMOOTH, BRIGHT, COLD-ROLLED FINISH	X		
NO. 3	STANDARD POLISH	100 GRIT FINISH WITH COARSER POLISHING LINES THAN #4	X		
NO. 4	STANDARD POLISH	BRIGHT SATIN FINISH WITH VERY FINE POLISHING LINES	X	X	X
NO. 6	STANDARD POLISHED, TAM-PICO BRUSHED	SOFT-LUSTERED, VELVETY FINISH	X	X	
NO. 7	HIGH LUSTRE POLISH	GLOSSY, BRIGHT, BUFFED FINISH	X	X	X

## CORROSION DATA

The table on the following pages contains data that gives the resistance of Stainless Steel, Types 302, 316, and 430, to various chemical media.

The key to the letters used in the table is:

Full Resistance.....	A
Satisfactory Resistance.....	B
Fair Resistance.....	C
Slight Resistance.....	D
No Resistance.....	E

### IMPORTANT NOTICE

This data should be regarded as indicative, and used as a basis for recommendation. It is not a basis for guarantee.

When questions arise concerning the stability of a metal for a specific application, call our nearest warehouse or sales office. We will be happy to help you.

Continued on next page

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# DATA

## CORROSION DATA (Continued)

Substance	Condition	Temp. F.	Type 316	Type 302	Type 430
ACETIC ACID, 5% Agitated.					
5%	Aerated	70°	A	A	A
5%		70°	A	A	A
5%		100°	A	A	B
5%		180°	A	A	D
10%	Agitated	70°	A	A	A
10%	Aerated	70°	A	A	A
10%		100°	A	A	
10%		180°	A	A	
10%		Boiling	A	C	
10%		60°	A	A	A
15%		100°	A	A	D
15%		180°	A	A	D
15%		Boiling	A	C	
20%	Agitated	70°	A	A	A
20%	Aerated	70°	A	A	A
20%	Aerated	180°	A	A	
33%		70°	A	A	C
33%		100°	A	A	D
33%		180°	A	A	
33%		Boiling	A	C	
40%	Aerated	180°	A	A	
50%		70°	A	A	C
50%		Boiling	A	C	E
60%		60°	A	A	C
60%		100°	A	A	D
60%		180°	A	A	
60%		Boiling	B	C	
80%		70°	A	A	C
80%		100°	A	A	D
80%		180°	A	A	
80%		Boiling	B	D	
90%	Aerated	180°	A	C	
100%		70°	A	A	A
100%		100°	A	A	A
100%		180°	A	A	C
100%		Boiling	B	C	
100%—150-lb. Press.		400°	C	E	
ACETIC ANHYDRIDE					
(90% Anhydride)		70°	A	A	A
(90% Anhydride)		180°	A	A	B
(90% Anhydride)		Boiling	A	A	C
Aerated (90% Anhydride)		180°	C	D	
60% Anhydride		180°	B	B	
30% Anhydride		180°	B	D	
ACETIC ACID VAPORS,					
30%		Hot	B	C	
100%		Hot	C	E	
ACETONE					
		70°	A	A	B
		Boiling	A	A	
ACETYL CHLORIDE					
		Cold	B	B	
		Boiling	B	B	
ACETYLENE					
		70°	A	A	A

Continued on next page

# DATA

## CORROSION DATA (Continued)

Substance	Condition	Temp. F.	Type 316	Type 302	Type 430
ACID SALT MIXP					
10% H <sub>2</sub> SO <sub>4</sub> Sp. G. 1.07					
+10% CuSO <sub>4</sub> • 5 H <sub>2</sub> O	Boiling		A	A	....
10% H <sub>2</sub> SO <sub>4</sub> Sp. G. 1.07					
+2% FeSO <sub>4</sub> • 7 H <sub>2</sub> O	Boiling		A	A	....
ALCOHOL, ETHYL	70°		A	A	A
	Boiling		A	A	A
ALCOHOL, METHYL	70°		A	A	A
	150°		B	*C	C
ALUMINUM, Molten	1400°		E	E	E
ALUMINUM ACETATE					
Saturated	70°		A	A	....
Saturated	Boiling		A	A	....
ALUMINUM CHLORIDE					
10% Quiescent	70°		C	D	D
25% Quiescent	70°		C	D	D
ALUMINUM FLUORIDE	70°		C	D	D
ALUMINUM HYDROXIDE					
Saturated	70°		A	*A	*A
ALUMINUM SULPHATE,					
5%	150°		A	*A	*A
10%	70°		A	*A	*B
10%	Boiling		A	*B	*C
Saturated	70°		A	*A	*D
Saturated	Boiling		A	*B	*E
ALUMINUM CHROMIUM					
Sulphate 5%	70°		A	*A	....
Sp. G. 1.6	Boiling		....	*E	....
ALUMINUM POTASSIUM					
SULPHATE					
(Alum), 2%	70°		A	*A	*A
10%	70°		A	*A	*B
10%	Boiling		A	*B	*C
Saturated	Boiling		B	*C	*D
AMMONIA (Dry or Moist)					
All concentrations	70-212°		A	A	A
AMMONIA (Anhydrous)	800° up		E	E	E
AMMONIUM					
HYDROXIDE					
	70°		A	A	A
	Boiling		A	A	A
AMMONIUM					
BICARBONATE					
	70°		A	A	....
	Hot		A	A	....
AMMONIUM BROMIDE,					
5%	70°		A	A	....
AMMONIUM CARBONATE					
1% Quiescent	70°	}	A	A	A
5% Quiescent	70°				
1% Aerated	70°				
5% Aerated	70°				
1% Agitated	70°				
5% Agitated	70°		A	A	A

Continued on next page

See notes page 304.

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## CORROSION DATA (Continued)

Substance	Condition	Temp. F.	Type 316	Type 302	Type 430
<b>AMMONIUM CHLORIDE</b>					
1% Quiescent		70°	A	*A	*A
1% Aerated		70°	A	*A	*A
1% Agitated		70°	A	*A	*A
10%		Boiling	*A	*A	*A
20%		Boiling	*A	*A	....
28%		Boiling	*A	*B	....
50%		Boiling	*A	*B	....
<b>AMMONIUM CHLOROSTANNATE</b>					
Saturated		70°	A	B	....
Saturated		140°	C	E	....
<b>AMMONIUM NITRATE</b>					
All Conc. Agitated		70°	A	A	A
Aerated					
Saturated		Boiling	A	A	A
<b>AMMONIUM OXALATE</b>					
5%		70°	A	A	A
<b>AMMONIUM PERCHLORATE</b>					
10%		Boiling	A	A	....
<b>AMMONIUM PERSULPHATE, 5%</b>					
		70°	A	A	A
<b>AMMONIUM PHOSPHATE, 5%</b>					
		70°	A	A	A
<b>AMMONIUM POTASSIUM Sulphate (Alum)</b>					
Dilute and Saturated		Various	A	*A	*B
<b>AMMONIUM SULPHATE</b>					
1% Aerated		70°	A	A	A
1% Agitated		70°	A	A	A
5% Aerated		70°	A	A	A
5% Agitated		70°	A	A	A
10%		Boiling	*A	*B	....
Saturated		Boiling	A	B	....
<b>AMMONIUM SULPHITE</b>					
		Boiling	A	A	....
ANILINE, 3%		70°	A	A	A
Concentrated Crude		70°	A	A	A
<b>ANILINE HYDROCHLORIDE</b>					
		70°	D	E	E
<b>ANTIMONY, Molten</b>					
		1100°	E	E	E
<b>ANTIMONY SULPHIDE, Molten</b>					
		1200-1600°	E	E	E
<b>ANTIMONY TRICHLORIDE</b>					
		70°	D	E	E
<b>ARSENIC ACID</b>					
		150°	A	A	....
<b>BARIUM CARBONATE</b>					
		70°	A	A	A
<b>BARIUM CHLORIDE, 5%</b>					
Saturated		70°	A	A	*A
Aqueous Solution		Hot	*A	*B	....

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# DATA

## CORROSION DATA (Continued)

Substance	Condition	Temp. F.	Type 316	Type 302	Type 430
BARIUM HYDROXIDE					
All concentrations.....	Cold and Hot		A	A	A
BARIUM NITRATE					
Aqueous Solution.....	Hot		A	A	....
BARIUM SULPHATE					
(Barytes-Blanc Fixe).....	70°		A	A	A
BEER (Barley Malt & Hops).....	70°		A	A	....
3.5%-4.5% Alcohol.....	160°		A	A	....
BENZENE (Benzol).....	70°		A	A	A
	Hot		A	A	A
BENZOIC ACID.....	70°		A	A	A
BLOOD (Meat Juices).....	Cold		A	*A	A
BORAX, 5%.....	Hot		A	A	A
BORACIC ACID, 5%.....	Hot or Cold		A	A	A
BORIC ACID, Saturated.....	Boiling		A	A	A
BROMINE—BROMINE					
WATER.....	70°		D	E	E
BUTTERMILK.....	70°		A	A	A
BUTYRIC ACID, 5%.....	70°		A	A	A
5%.....	150°		A	A	A
Aqueous Solution					
Sp. G. .964.....	Boiling		A	A	A
CALCIUM CARBONATE.....	70°		A	A	A
CALCIUM CHLORATE,					
Dilute.....	Cold and Hot		A	A	....
CALCIUM CHLORIDE,					
Dilute.....	70°		*A	*B	*C
Conc. Solutions.....	70°		*A	*B	*C
CALCIUM					
CHLOROHYPOCHLORITE					
(Bleaching Powder), 1%.....	70°		‡B	‡C	....
5%.....			‡C	‡C	....
CALCIUM					
HYPOCHLORITE, 2%.....	70°		‡A	*B	‡C
Aqueous Solution					
Sp. G. 1.04.....	100°		‡A	‡C	‡C
CALCIUM CHLORATE					
Dilute Solution.....	70°		A	A	....
Dilute Solution.....	Hot		A	A	....
CALCIUM HYDROXIDE,					
10%.....	Boiling		A	A	....
20%.....	Boiling		A	A	....
50%.....	Boiling		B	C	....
CALCIUM SULPHATE,					
Saturated.....	70°		A	A	A
CADMIUM.....	Molten		C	C	....
CAMPHOR.....	70°		A	A	A
CANE JUICE (Sugar Cane).....	Hot		A	A	....
CARBOLIC ACID (Phenol)					
C.P. Plus 10% water.....	Boiling		A	A	A
C.P.....	70°		A	A	A

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## CORROSION DATA (Continued)

Substance	Condition	Temp. F.	Type 316	Type 302	Type 430
CARBOLIC ACID (Phenol) (Continued)					
C.P.	(Boil)	360°	A	A	....
Crude		212°	A	A	....
Crude		Boiling	A	A	....
CARBON BISULPHIDE		70°	A	A	A
CARBON MONOXIDE GAS		1400°	A	A	A
		1600°	A	A	A
CARBON TETRA- CHLORIDE, C.P.					
C.P.		70°	A	A	A
		Boiling	A	A	....
Commercial plus 1% water		Boiling	*B	....	....
Commercial plus 1% HCl		Boiling	*B	....	....
CARBONATED WATER (Carbonic Acid)					
			A	A	A
CARBONATED BEVERAGES					
Various concentrations		Cold	A	A	....
CARBONIC ACID					
All concentrations		Cold and Hot	A	A	A
CARNALLITE—Cold					
Saturated					
Solution		Boiling	B	B	....
(KCl • MgCl <sub>2</sub> • 6H <sub>2</sub> O)					
CAUSTIC SODA (See Sodium Hydroxide)					
CHINOSOL ANTISEPTIC					
Aqueous					
Solution, 1-500 dilution		70°	A	A	....
CELLULOSE			A	A	A
CHLORACETIC ACID		70°	C	D	E
CHLORINE GAS, Dry		70°	A	A	C
Moist		70°	C	D	E
		212°	D	E	E
CHLORINATED WATER					
Saturated		70°	†B	†C	D
CHLORIC ACID		70°	D	E	E
CHLOROBENZENE (Phenyl Chloride), C.P.					
		70°	A	A	A
		Boiling	A	A	....
CHLOROFORM		70°	A	A	A
CHLOROSULPHONIC ACID					
Dilute		70°	E	E	E
CHROMIC ACID,					
5% C.P.		70°	A	A	B
10% C.P.		70°	B	B	....
10% C.P.		Boiling	B	C	D
50% C.P.		70°	B	B	....
50% C.P.		Boiling	....	C	....
Commercial, 50% (Cont. SO <sub>3</sub> )		70°	A	A	....
Commercial, 50% (Cont. SO <sub>3</sub> )		Boiling	C	*D	D

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# DATA

## CORROSION DATA (Continued)

Substance	Condition	Temp. F.	Type 316	Type 302	Type 430
CHROMIUM PLATING					
BATH.....		70°	A	A	....
CIDER.....		70°	A	A	A
CITRIC ACID,					
5% Quiescent.....		70°	A	A	A
5% Quiescent.....		150°	A	A	A
10%.....		70°	A	A	A
10%.....		Boiling	A	B	....
15%.....		70°	A	A	....
15%.....		Boiling	A	B	B
25%.....		70°	A	A	....
25%.....		Boiling	A	D	....
50%.....		70°	A	A	....
50%.....		Boiling	A	D	....
Conc.....		Boiling	B	C	....
5%—45-lb. sq. in. Press.....		284°	B	D	....
COCA-COLA SYRUP (Pure).....		70°	A	A	A
COFFEE.....		Boiling	A	A	A
COPPERAS, (See Ferrous Sulphate),.....					
COPPER ACETATE					
Sat. Solution.....		70°	A	A	A
COPPER CARBONATE Sat.					
Sol. in 50% NH <sub>4</sub> OH.....			A	A	A
COPPER CHLORIDE					
(Cupric Chloride)					
1% Agitated.....		70°	*A	*B	*B
1% Aerated.....		70°	*A	*B	*B
5% Agitated.....		70°	*B	*C	*B
5% Aerated.....		70°	*C	*E	*E
COPPER CYANIDE					
(Cupric Cyanide)					
Sat. Solution.....		Boiling	A	A	A
COPPER NITRATE					
(Cupric Nitrate)					
1% Quiescent.....		70°	A	A	A
1% Agitated.....		70°	A	A	A
1% Aerated.....		70°	A	A	A
5% Quiescent.....		70°	A	A	A
5% Agitated.....		70°	A	A	A
5% Aerated.....		70°	A	A	A
50% Aqueous Sol.....		Boiling	A	A	....
COPPER SULPHATE					
(Cupric Sulphate)					
5% Agitated.....		70°	A	A	A
5% Aerated.....		70°	A	A	A
Sat. Solution.....		Boiling	A	A	....
CREAM OF TARTAR.....		Cold and Hot	A	A	....
CREOSOTE (Coal Tar).....		Hot	A	A	....
CREOSOTE OIL.....		Hot	A	A	....
CYANOGEN GAS.....		70°	A	A	....

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## CORROSION DATA (Continued)

Substance	Condition	Temp. F.	Type 316	Type 302	Type 430
DICHLOROETHANE	Boiling		A	A	....
DINITROCHLOROBENZENE					
Melted and Solidified	70°		A	A	A
DISTILLERY WORT	70°		A	A	A
DYEWOOD LIQUOR	70°		A	SA	....
EPSOM SALT (Magnesium Sulphate)	Hot and Cold		A	A	A
ETHER	70°		A	A	A
ETHYL CHLORIDE	70°		A	A	A
ETHYLENE CHLORIDE	70°		A	A	....
FERRIC CHLORIDE					
1% to Saturation	70°		E	E	E
FERRIC HYDROXIDE (Hydrated Iron Oxide)	70°		A	*A	....
FERRIC NITRATE,					
1% Quiescent	70°		A	A	A
5% Quiescent	70°		A	A	A
1% Agitated	70°		A	A	A
5% Agitated	70°		A	A	A
1% Aerated	70°		A	A	A
5% Aerated	70°		A	A	A
FERRIC SULPHATE					
1% Quiescent	70°		A	A	A
1% Aerated	70°		A	A	A
1% Agitated	70°		A	A	A
5% Quiescent	70°		A	A	A
5% Aerated	70°		A	A	A
5% Agitated	70°		A	A	A
10% Boiling			A	A	....
FERROUS SULPHATE					
10%	70°		A	*A	*A
10% Boiling			A	*A	....
FLUORINE (Gas)	70°		E	E	E
FORMALINE (40% Formaldehyde)	70°		A	A	A
FORMIC ACID, 5%	70°		A	B	B
5%	150°		A	B	B
10%	70°		A	B	B
10% Boiling			A	A	E
FORMIC ACID, 50%	70°		A	B	B
50%	Boiling		A	A	E
90%	Boiling		A	A	....
100%	70°		A	A	....
100% Boiling			B	B	....
FRUIT JUICES	70°		A	A	A
FUEL OIL	Hot		A	A	....
Cont. Sulphuric Acid			B	C	....
FURFURAL	70°		A	A	....

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# DATA

## CORROSION DATA (Continued)

Substance	Condition	Temp. F.	Type 316	Type 302	Type 430
GALLIC ACID, 5%.....		70°	A	A	A
5%.....		150°	A	A	A
Sat. at 212° F.....		Boiling	A	A	....
GASOLINE.....		70°	A	A	A
GELATIN.....		Cold to 140°	A	A	A
GLAUBER'S SALT (See Sodium Sulphate)					
GLUE, DRY.....		70°	A	A	A
Acid Solution.....		70°	A	*B	....
Acid Solution.....		140°	A	*B	....
GLYCERINE.....		70°	A	A	A
GYPSUM (See Calcium Sulphate)					
HYDROCHLORIC ACID, All Conc.....		70°	E	E	E
HYDROBROMIE ACID All concentrations.....		Cold and Hot	E	E	E
HYDROCYANIC ACID.....		70°	A	A	C
HYDROFLUISILIC ACID.....		70°	D	E	....
HYDROFLUORIC ACID All concentrations.....		Cold and Hot	E	E	E
HYDROGEN PEROXIDE.....		70°	A	\$A	\$A
		Boiling	A	\$B	\$B
HYDROGEN SULPHIDE, Dry.....		70°	A	A	A
Wet.....		70°	\$A	\$C	\$C
INK.....		70°	A	\$B	....
IODINE.....		70°	D	E	E
IODOFORM.....		70°	A	A	....
KEROSENE.....		70°	A	A	A
KETSUP, Quiescent.....		70°	A	*A	*A
Quiescent.....		150°	A	*A	*A
LACTIC ACID, 1%.....		70°	A	A	A
1%.....		Boiling	A	A	B
5%.....		70°	A	A	A
5%.....		150°	A	B	B
5%.....		Boiling	A	B	B
10%.....		70°	A	A	B
10%.....		150°	A	B	....
10%.....		Boiling	A	B	E
Conc.....		70°	A	A	....
Conc.....		Boiling	B	C	....
LARD.....		70°	A	A	A
LEAD, Molten.....		750°	B	B	B
LEAD, ACETATE, 5%.....		Boiling	A	A	....
LINSEED OIL.....		70°	A	A	A
Plus 3% H <sub>2</sub> SO <sub>4</sub> .....		390°	A	A	....
LYSOL.....		70°	A	A	D

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## CORROSION DATA (Continued)

Substance	Condition	Temp. F.	Type 316	Type 302	Type 430
MAGNESIUM CARBONATE					
All concentrations.....	Cold and Hot		A	A	A
MAGNESIUM CHLORIDE					
1% Quiescent.....	70°		A	*A	*A
1% Quiescent.....	Hot		*B	*C	.....
5% Quiescent.....	70°		A	*A	*A
5% Quiescent.....	Hot		*B	*C	.....
MAGNESIUM HYDROXIDE					
Thick Suspension.....	70°		A	A	.....
MAGNESIUM NITRATE					
All concentrations.....	Cold and Hot		A	A	A
MAGNESIUM OXYCHLORIDE.....	70°		*B	*C	.....
MAGNESIUM SULPHATE (See Epsom Salt)					
MALIC ACID.....	Cold and Hot		A	A	A
MANGANESE CARBONATE					
All concentrations.....	Cold and Hot		A	A	A
MASH.....	Hot		A	A	.....
MAYONNAISE.....	70°		A	*A	.....
MERCURY.....			A	A	.....
MERCURIC CHLORIDE					
Dilute Solution.....	70°		*D	*E	E
MERCUROUS NITRATE					
All concentrations.....	Cold and Hot		A	A	A
METHANOL (See Alcohol, Methyl)					
METHYLENE CHLORIDE, 40%.....	Cold and Hot		A	A	.....
MILK, Fresh or Sour.....	70°		A	A	A
	Boiling		A	A	.....
MINE WATER-ACID.....	60°		*A	*A	.....
MOLASSES.....			A	A	A
MOLYBDIC ACID, 5%.....	70°		A	A	.....
MUSTARD.....	70°		A	*A	*A
MURIATIC ACID.....	70°		E	E	E
NAPHTHA, Pure.....	70°		A	A	A
Crude.....	70°		A	A	.....
NAPHTHALENESULFONIC ACID.....	70°		A	A	.....
NICKEL CHLORIDE, Solution.....	70°		*A	*A	.....
NICKEL NITRATE					
All concentrations.....	Cold and Hot		A	A	A
NICKEL SULPHATE.....	Cold and Hot		A	A	.....
NITER CAKE.....	Fused		A	B	B
NITRATING SOLUTIONS.....	Cold and Hot		B	B	B
NITRIC ACID, 5%.....	70°		A	A	A
5%.....	Boiling		A	A	C
20%.....	70°		A	A	A
20%.....	Boiling		A	A	B

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# DATA

## CORROSION DATA (Continued)

Substance	Condition	Temp. F.	Type 316	Type 302	Type 430
NITRIC ACID (Continued)					
40%		70°	A	A	A
40%		Boiling	A	A	B
50%		70°	A	A	A
50%		Boiling	A	A	B
65%		70°	A	A	A
65%		Boiling	B	B	B
Conc.		70°	A	A	A
Conc.		Boiling	B	B	C
Fuming Conc.		70°	A	A	A
Fuming Conc.		110°	A	A	A
Fuming Conc.		Boiling	D	D	D
NITROUS ACID, 5%		70°	A	A	A
OILS, Crude					
OILS, Vegetable, Mineral		Cold and Hot	\$A	\$A	\$A
OLEIC ACID		Cold and Hot	A	\$A	\$A
		70°	A	*A	*B
		300°	A	*A	*B
		400°	A	*A	....
OXALIC ACID, 5%		70°	A	A	A
5%		Boiling	A	A	A
10%		70°	A	A	B
10%		Boiling	C	D	E
25%		Boiling	C	D	....
50%		Boiling	C	D	....
PARAFFIN		Cold and Hot	A	A	A
PAREGORIC COMPOUND		70°	A	A	....
PHENOL (See Carbolic Acid)					
PHENOLIC RISINS		Cold and Hot	A	A	....
PETROLEUM ETHER			A	A	A
PHOSPHORIC ACID, 1%		70°	+A	+A	+A
1%		Boiling	A	A	....
1%—45-lb. Press.		284°	A	A	....
5% Quiescent		70°	A	A	A
5% Agitated		70°	A	A	A
5% Aerated		70°	A	A	A
10% Quiescent		70°	A	A	A
10% Agitated		70°	A	A	A
10% Aerated		70°	A	A	A
10%		Boiling	A	A	B
25%		Boiling	B	A	B
45%		Boiling	B	B	C
50%		Boiling	B	B	B
80%		70°	B	B	B
80%		230°	C	E	E
85%		Boiling	C	E	E
PHOSPHORIC ANHYDRIDE					
Dry		Cold and Hot	A	A	....

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## CORROSION DATA (Continued)

Substance	Condition	Temp. F.	Type 316	Type 302	Type 430
<b>PHOTOGRAPHIC SOLUTIONS</b>					
Film and Paper Developers...	70°		A	A	C
Hypo (Acid Fixing Baths)...	70°		\$A	\$A	D
Other Solutions (Toners, Reducers, Tray Cleaners, etc.)	Details on request				
PICRIC ACID	70°		A	A	A
PINE TAR OIL	Cold and Hot		A	A	...
POTASH (See Potassium Hydroxide)					
<b>POTASSIUM</b>					
BICHROMATE	25% 70°		A	A	A
	25% Boiling		A	A	...
POTASSIUM BROMIDE	70°		*A	*B	...
<b>POTASSIUM CARBONATE</b>					
1% Quiescent	70°		A	A	A
Agitated	70°		A	A	A
Aerated	70°		A	A	A
50%	Boiling		A	A	...
<b>POTASSIUM CHLORATE</b>					
Sat. at 212°	Boiling		A	A	A
<b>POTASSIUM CHLORIDE</b>					
1% Quiescent	70°		A	A	*A
1% Agitated	70°		A	A	*A
1% Aerated	70°		A	A	*A
5% Quiescent	70°		A	A	*A
5% Agitated	70°		A	A	*A
5% Aerated	70°		A	A	*A
5%	Boiling		A	A	...
<b>POTASSIUM DICHROMATE</b>					
All concentrations (neutral)	Cold and Hot		A	A	A
<b>POTASSIUM FERRICYANIDE, 5%</b>					
	70°		A	A	A
25%	70°		A	A	...
25%	Boiling		A	A	...
<b>POTASSIUM FERROCYANIDE, 5%</b>					
	70°		A	A	A
<b>POTASSIUM HYDROXIDE</b>					
5% Quiescent	70°		A	A	A
5% Agitated	70°		A	A	A
5% Aerated	70°		A	A	A
27%	Boiling		A	A	...
50%	Boiling		A	B	...
<b>POTASSIUM HYPOCHLORITE</b>					
Conc.	70°		B	B	...
<b>POTASSIUM IODIDE</b>					
All concentrations	Cold and Hot		A	A	...

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# DATA

## CORROSION DATA (Continued)

Substance	Condition	Temp. F.	Type 316	Type 302	Type 430
POTASSIUM NITRATE					
	Quiescent				
	1% Agitated	70°	A	A	A
	Aerated				
	Quiescent				
	5% Agitated	70°	A	A	A
	Aerated				
50%		70°	A	A	....
50%		Boiling	A	A	....
Molten		1022°	A	A	....
POTASSIUM OXALATE		70°	A	A	A
POTASSIUM PERMANGANATE					
		70°	A	A	A
5%		Boiling	A	A	....
POTASSIUM SULPHATE					
1%	Quiescent	70°	A	A	A
1%	Agitated	70°	A	A	A
1%	Aerated	70°	A	A	A
5%	Quiescent	70°	A	A	A
5%	Agitated	70°	A	A	A
5%	Aerated	70°	A	A	A
5%		Hot	A	A	A
PYROGALLIC ACID					
			A	A	A
QUININE SULPHATE,					
	Dry		A	A	B
QUININE BISULPHATE,					
	Dry		A	B	B
ROSIN, Molten					
			A	A	A
SAUERKRAUT BRINE		70°	A	E	....
SEA WATER		70°	*A	*A	*C
SEWAGE			\$A	\$A	
SILVER BROMIDE			*A	*B	*C
SILVER CHLORIDE			E	E	E
SILVER NITRATE, 10%		70°	A	A	A
10%		Boiling	A	A	....
SOAP		70°	A	A	A
SODIUM ACETATE,					
	Moist		A	*A	A
SODIUM CARBONATE, 5%					
		70°	A	A	A
5%		150°	A	A	A
5%		Boiling	A	A	A
50%		Boiling	A	A	....
Molten		1650°	E	E	....
SODIUM BICARBONATE					
	All concentrations	70°	A	A	A
5%	Quiescent	150°	A	A	A
SODIUM BISULPHATE					
	All concentrations (neutral)	Cold and Hot	A	*A	....

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GENERAL

# DATA

## CORROSION DATA (Continued)

Substance	Condition	Temp. F.	Type 316	Type 302	Type 430
SODIUM BORATE					
All concentrations.....	Cold and Hot		A	A	A
SODIUM CHLORATE					
25%.....	Cold and Hot		A	A	....
SODIUM CHLORIDE					
5% Quiescent.....	70°		A	*A	*B
5% Quiescent.....	150°		A	*A	*B
20% Aerated.....	70°		A	*A	....
Saturated.....	70°		A	*A	....
Saturated.....	Boiling		A	*B	....
SODIUM CITRATE					
All concentrations.....	Cold and Hot		A	A	....
SODIUM FERRICYANIDE					
5% (neutral).....	Cold and Hot		*A	*A	....
SODIUM FLUORIDE, 5%.....	70°		*A	*B	C
SODIUM HYDROXIDE,					
20%.....	Boiling		A	A	....
30%.....	Boiling		B	B	....
Molten.....	600°		B	B	....
SODIUM HYPOCHLORITE,					
5%.....	70°		†A	†B	†C
SODIUM LOCATE, 10%.....	Cold and Hot		A	A	....
SODIUM NITRATE					
All concentrations.....	Cold and Hot		A	A	A
SODIUM NITRATE.....	Fused		A	B	C
SODIUM NITRITE					
All concentrations.....	Cold and Hot		A	A	....
SODIUM PERCHLORATE,					
10%.....	70°		A	A	....
10%.....	Boiling		A	A	....
SODIUM PEROXIDE, 10%.....	70°		A	A	....
10%.....	200°		A	A	....
SODIUM PHOSPHATE					
5%.....	Cold and Hot		A	A	....
SODIUM SALICYLATE					
All concentrations.....	70°		A	A	A
SODIUM SILICATE.....	Cold and Hot		A	A	A
SODIUM SULPHATE, 5%.....	70°		A	A	....
Saturated.....	Boiling		A	A	....
SODIUM SULPHITE, 5%.....	70°		A	A	C
10%.....	150°		A	A	....
25%.....	Boiling		A	A	A
50%.....	Boiling		A	A	....
SODIUM HYPOSULPHITE,					
25%.....	70°		A	§A	B
25%.....	Boiling		A	A	....
SODIUM SULPHIDE,					
Saturated.....	70°		A	*B	....
SOY BEAN OIL.....	Cold and Hot		A	A	....
STANNIC CHLORIDE,					
Sp. G. 1.21.....	70°		C	D	....
Sp. G. 1.21.....	Boiling		D	E	....

Continued on next page

See notes page 304.

# DATA

## CORROSION DATA (Continued)

Substance	Condition	Temp. F.	Type 316	Type 302	Type 430
STANNOUS CHLORIDE,					
Saturated		120°	A	B	....
		Boiling	...	E	....
STARCH, Aq. Solution			A	A	....
STEARIC ACID			A	A	A
STRONTIUM					
HYDROXIDE			A	A	....
STRONTIUM NITRATE,					
Solution		Hot	A	A	....
SUGAR, Juice		Hot	A	A	A
SULPHUR CHLORIDE		Cold and Hot	E	E	E
SULPHUR, Moist		70°	*A	*B	*B
Molten		266°	A	A	A
Molten		833°	C	C	....
SULPHUR					
MONOCHLORIDE		70°	A	A	....
SULPHUR DIOXIDE GAS,					
Moist		70°	A	B	C
Gas		575°	A	A	A
SULPHURIC ACID, 5%		70°	B	C	C
5%		Boiling	C	E	E
10%		70°	B	C	C
10%		Boiling	D	E	E
50%		70°	C	D	....
50%		Boiling	D	E	E
Conc.		70°	A	A	A
Conc.		Boiling	D	D	D
Conc.		300°	E	E	E
Fuming		70°	B	C	....
SULPHUROUS ACID,					
Saturated		70°	B	C	C
Saturated, 60-lb. Press		250°	B	C	C
Saturated, 70-125-lb. Press		310°	C	C	C
Saturated, 150-lb. Press		375°	C	C	C
Spray		70°	*D	*D	....
SWEET WATER		Hot	A	A	*A
SYRUP		Hot	A	A	....
TANNIC ACID					
		70°	A	A	A
		150°	A	B	A
TANNING LIQUOR					
TAR		70°	A	A	....
TARTARIC ACID, 10%		70°	A	A	A
10%		Boiling	A	A	B
50%		Boiling	A	A	....
Saturated at 212°		Boiling	...	E	....
TIN, Molten			C	C	C
TRICHLORACETIC ACID		70°	D	E	E
TUNG OIL		Cold and Hot	A	A	....
TURPENTINE OIL		95°	A	A	....
URIC ACID					
		70°	A	A	....

Continued on next page See notes page 304.

NA

MONEI-NICKEL

GENERAL

LAHOMA



# DATA

## CORROSION DATA (Continued)

Substance	Condition	Temp. F.	Type 316	Type 302	Type 430
VARNISH		70°	A	A	A
		Hot	A	A	....
VEGETABLE JUICES			A	A	....
VINEGAR, Quiescent		70°	A	A	A
Agitated		70°	A	A	A
Aerated		70°	A	A	A
		Hot	A	A	....
VINEGAR FUMES		70°	A	B	B
WHISKEY			A	A	....
WINE, in all phases of processing and storage		75°	A	A	A
WOOD PULP			A	A	....
WOOD PULP LIQUORS					
Digestive Liquors (3% Ca (HSO <sub>3</sub> ) <sub>2</sub> + 2% H <sub>2</sub> SO <sub>4</sub> + SO <sub>2</sub> + Air)		Boiling	A	E	....
Black Waste Liquors (Alkaline) Fired		1800°	E	E	E
Black Waste Liquors		Boiling	A	A	A
WORT			A	A	....
YEAST			A	A	....
ZINC, Molten			E	E	E
ZINC CHLORIDE, 5%		70°	A	A	*A
5%		Boiling	*A	*B	*B
20%		70°	A	A	*A
20%		Boiling	A	B	*E
70%		70°	A	A	....
70%		Boiling	A	D	....
ZINC CYANIDE, Moist		70°	A	A	....
ZINC NITRATE, Solution		Hot	A	A	....
ZINC SULPHATE, 5%		70°	A	A	A
25%		Boiling	A	A	....
Saturated		70°	A	A	A

\*Subject to pitting at air line or when allowed to dry.

†Keep solutions alkaline.

‡Not recommended for standing baths.

§May attack when sulphuric acid is present.

\*May attack when hydrochloric acid is present.

## TECHNICAL PROPERTIES OF POPULAR GRADES OF STAINLESS STEELS

Grade—Type Number	Type 302	Type 303†
<b>PHYSICAL PROPERTIES</b>		
Density, lb./cu. in.	0.29	0.29
Mod. of Elasticity in Tension $\times 10^6$ p.s.i.	28.0	28.0
Structure	Austenitic	Austenitic
Specific Heat, B.t.u./° F./lb. 32-212° F.	0.12	0.12
Thermal Conductivity, /212° F. B.t.u./sq. ft./hr./° F./ft. 932° F.	9.4 12.4	9.4 12.4
Mean Coefficient of Thermal Expansion per ° F. $\times 10^{-6}$ 32-212° F. 32-600° F. 32-1000° F. 32-1200° F.	9.6 9.9 10.2 10.4	9.6 9.9 10.2 10.4
Melting Point Range	2550-2590° F.	2550-2590° F.
<b>ELECTRICAL PROPERTIES</b>		
Magnetic Permeability, Annealed	Non-magnetic $\mu = 1.003$	Non-magnetic $\mu = 1.003$
Elec. Resistivity, microhms-cm, 70° F.	72.0	72.0
<b>MECHANICAL PROPERTIES</b>		
Brinell Hardness { Annealed Heat Treated (Bars) Cold Drawn	135-185 180-330	130-150 180-330
Rockwell Hardness { Annealed Heat Treated (Sheet or Strip) Cold Rolled	75-90 R <sub>B</sub> 10-35 R <sub>C</sub>	72-80 R <sub>B</sub> .....
Ultimate Tensile Strength, lbs./sq. in. { Annealed Heat Treated Cold Worked*	80,000-100,000 100,000-180,000	80,000-100,000 100,000
Yield Point, lbs./sq. in. { Annealed Heat Treated Cold Worked*	35,000-50,000 50,000-150,000	35,000-50,000 60,000
Elongation in 2 inches { Annealed Heat Treated Cold Worked*	60-55% 50-10%	60-50% 40%
Reduction of Area { Annealed Heat Treated Cold Worked*	60-55% (Bars) .....	60-55% (Bars) 53%
Impact Strength, Izod Value, ft. lbs. { Annealed Heat Treated	110-70 .....	110-70 .....
Ductility, { Olsen, inches Annealed Ericksen, mms.	0.400-0.425 .....	..... .....
Creep Strength, Life of 10,000 hrs. with 1% Elongation, lbs. per sq. in. { At 1000° F. At 1100° F. At 1200° F. At 1300° F.	17,000 12,000 7,000 4,000	16,500 11,500 6,500 3,500
Strength at Elevated Temps., Short Time Tests, lbs./sq. in. { 1300° F. 1500° F. 1700° F.	36,000 22,000 13,500	34,000 20,000 12,500
<b>HEAT TREATMENT</b>		
Full Anneal	Cool rapidly from 1850-2050° F.	Cool rapidly from 1850-2050° F.
Process Anneal	Same as full	Same as full
Hardening—Quench from	Non-hardening	Non-hardening
Tempering	Non-hardening	Non-hardening
Initial Forging { Start Finish	2200° F. Over 1700° F.	2200° F. Over 1700° F.†
<b>HEAT RESISTANCE</b>		
Scaling { Continuous Service Temperature Intermittent Service	1600° F. 1450° F.	1600° F. 1450° F.
<b>WELDING PROPERTIES</b>		
	Very good. Tough welds.	Fusion welding not recommended
<b>MACHINING PROPERTIES</b> , Compared to Bessemer Screw Stock No. B1112		
	About 45%	About 70%
<b>DRAWING OR STAMPING</b>		
	Good	Fairly good

\*These mechanical property values apply to cold rolled sheet or strip in Type 430 and all Type 300 series except Type 303. In Type 303 and all of Type 400 series with the exception of Type 430, these representative mechanical property values apply to annealed and cold drawn one inch diameter bar stock.

†This analysis designed for machining applications and is not recommended for forging operations requiring severe deformation.

NA

MONEL-NICKEL

GENERAL

LAHOMA

# **TECHNICAL PROPERTIES OF POPULAR GRADES OF STAINLESS STEELS (Continued)**

Grade—Type Number		Type 303	Type 310
<b>PHYSICAL PROPERTIES</b>			
Density, lb./cu. in.		0.29	0.29
Mod. of Elasticity in Tension $\times 10^6$ p.s.i.		29.0	29.0
Structure		Austenitic	Austenitic
Specific Heat, B.t.u./° F./lb. 32-212° F.		0.12	0.12
Thermal Conductivity, (212° F.		8.0	8.0
B.t.u./sq. ft./hr./° F./ft. 1932° F.		10.8	10.8
Mean Coefficient of Thermal Expansion 32-212° F.		8.3	8.0
32-600° F.		9.3	9.0
32-1000° F.		9.6	9.4
per ° F. $\times 10^{-6}$ 32-1200° F.		10.0	9.7
Melting Point Range		2550-2650° F.	2550-2650° F.
<b>ELECTRICAL PROPERTIES</b>			
Magnetic Permeability, Annealed		Non-magnetic	Non-magnetic
Elec. Resistivity, microhms-cm, 70° F.		$\mu = 1.003$ 78.0	$\mu = 1.003$ 79.0
<b>MECHANICAL PROPERTIES</b>			
Brinell Hardness (Bars)	Annealed	140-185	145-210
	Heat Treated Cold Drawn	.....	.....
Rockwell Hardness (Sheet or Strip)	Annealed	75-90 R <sub>B</sub>	80-95 R <sub>B</sub>
	Heat Treated Cold Rolled	.....	.....
Ultimate Tensile Strength, lbs./sq. in.	Annealed	90,000-110,000	90,000-100,000
	Heat Treated Cold Worked*	.....	.....
Yield Point, lbs./sq. in.	Annealed	40,000-60,000	40,000-60,000
	Heat Treated Cold Worked*	.....	.....
Elongation in 2 inches	Annealed	60-50%	55-45%
	Heat Treated Cold Worked*	.....	.....
Reduction of Area	Annealed	65-50% (Bars)	60-50% (Bars)
	Heat Treated Cold Worked*	.....	.....
Impact Strength, Izod Value, ft. lbs.	Annealed	100	90
	Heat Treated	.....	.....
Ductility, Olsen, inches	Annealed	7-8	.....
	Ericksen, mms.	.....	.....
Creep Strength, Life of 10,000 hrs. with 1% Elongation, lbs. per sq. in.	At 1000° F.	17,000	17,000
	At 1100° F.	13,000	13,000
	At 1200° F.	8,500	9,000
	At 1300° F.	4,500	4,500
Strength at Elevated Temps., Short Time Tests, lbs./sq. in.	1300° F.	45,000	50,000
	1500° F.	28,000	32,000
	1700° F.	16,000	17,500
<b>HEAT TREATMENT</b>			
Full Anneal		Cool rapidly from 1900-2050° F.	Cool rapidly from 1900-2100° F.
Process Anneal		Same as full	Same as full
Hardening—Quench from		Non-hardening	Non-hardening
Tempering		Non-hardening	Non-hardening
Initial Forging (Start Finish)	2150° F.	2150° F.	2150° F.
	Over 1800° F.	Over 1800° F.	Over 1800° F.
<b>HEAT RESISTANCE</b>			
Scaling Temperature	Continuous Service	2000° F.	2000° F.
	Intermittent Service	1800° F.	1900° F.
<b>WELDING PROPERTIES</b>		Good Tough Welds	Good Tough Welds
<b>MACHINING PROPERTIES</b> , Compared to Bessemer Screw Stock No. B1112		About 45%	About 45%
<b>DRAWING OR STAMPING</b>		Good	Good

\*These mechanical property values apply to cold rolled sheet or strip in Type 430 and all Type 300 series except Type 303. In Type 303 and all of Type 400 series with the exception of Type 430, these representative mechanical property values apply to annealed and cold drawn one inch diameter bar stock.



## TECHNICAL PROPERTIES OF POPULAR GRADES OF STAINLESS STEELS (Continued)

Grade—Type Number	Type 316	Type 347
<b>PHYSICAL PROPERTIES</b>	Type 317 Same Except Analysis	
Density, lb./cu. in.	0.29	0.29
Mod of Elasticity in Tension ×10 <sup>6</sup> p.s.i.	28.0	28.0
Structure	Austenitic	Austenitic
Specific Heat, B.t.u./° F./lb. 32-212° F.	0.12	0.12
Thermal Conductivity B.t.u./sq. ft./hr./° F./ft. (212° F. 932° F.)	9.4 12.4	9.3 12.8
Mean coefficient of Thermal Expansion (32-212° F. 32-600° F. 32-1000° F. 32-1200° F.)	8.9 9.0 9.7 10.3	9.3 9.5 10.3 10.6
Melting Point Range	2500-2550° F.	2550-2600° F.
<b>ELECTRICAL PROPERTIES</b>	Non-magnetic	Non-magnetic
Magnetic Permeability, Annealed	$\mu = 1.003$	$\mu = 1.02$
Elec. Resistivity, microhms-cm. 70° F.	74.0	72.0
<b>MECHANICAL PROPERTIES</b>		
Brinell (Annealed)	135-185	135-185
Hardness (Heat Treated)	.....	.....
(Bars) Cold Drawn	180-300	.....
Rockwell (Annealed)	70-90 R <sub>B</sub>	70-90 R <sub>B</sub>
Hardness (Heat Treated)	.....	.....
(Sheet or strip) Cold Rolled	10-30 R <sub>C</sub>	10-35 R <sub>C</sub>
Ultimate Tensile Strength, lbs./sq. in.	80,000-95,000	80,000-100,000
(Annealed)	100,000-150,000	100,000-150,000
(Heat Treated)	.....	.....
(Cold Worked*)	.....	.....
Yield Point, lbs./sq. in.	35,000-55,000	35,000-55,000
(Annealed)	50,000-125,000	50,000-125,000
(Heat Treated)	.....	.....
(Cold Worked*)	.....	.....
Elongation in 2 inches	60-50%	50-40%
(Annealed)	50-15%	50-10%
(Heat Treated)	.....	.....
(Cold Worked*)	.....	.....
Reduction of Area	75-60% (Bars)	65-55% (Bars)
(Annealed)	.....	.....
(Heat Treated)	.....	.....
(Cold Worked*)	.....	.....
Impact Strength, Izod Value, ft. lbs.	120-70	100
(Annealed)	.....	.....
(Heat Treated)	.....	.....
Ductility, Olsen, inches	0.40-0.50	0.40-0.50
(Annealed)	10-14	12
Ericksen, mms.	.....	.....
Creep Strength, Life of 10,000 hrs. with 1% Elongation, lbs. per sq. in.	At 1000° F. 22,500 At 1100° F. 17,000 At 1200° F. 11,000 At 1300° F. 7,100	18,500 14,000 9,500 5,400
Strength at Elevated Temps., Short Time Tests, lbs./sq. in.	1300° F. 48,000 1500° F. 28,000 1700° F. 18,000	40,000 23,500 17,500
<b>HEAT TREATMENT</b>	Cool rapidly from 1850-2050° F.	Cool rapidly from 1850-2050° F.
Full Anneal	.....	.....
Process Anneal	Same as full	Same as full
Hardening—Quench from	Non-hardening	Non-hardening
Tempering	Non-hardening	Non-hardening
Initial Forging (Start Finish)	2200° F. Over 1700° F.	2200° F. Over 1800° F.
<b>HEAT RESISTANCE</b>		
Scaling Temperature	1650° F. 1500° F.	1600° F. 1450° F.
(Continuous Service Intermittent Service)	.....	.....
<b>WELDING PROPERTIES</b>	Very Good. Tough Welds.	Very Good. Tough Welds.
<b>MACHINING PROPERTIES</b> , Compared to Bessemer Screw Stock No. B1112	About 45%	About 45%
<b>DRAWING OR STAMPING</b>	Good.	Good.

\*These mechanical property values apply to cold rolled sheet or strip in Type 430 and all Type 300 series except Type 303. In Type 303 and all of Type 400 series with the exception of Type 430, these representative mechanical property values apply to annealed and cold drawn one inch diameter bar stock.

# **TECHNICAL PROPERTIES OF POPULAR GRADES OF STAINLESS STEELS (Continued)**

Grade—Type Number	Type 410	Type 416
<b>PHYSICAL PROPERTIES</b>		
Density, lb./cu. in.	Specify .10 min. Carb. for hardenable grade 0.28	0.28
Mod. of Elasticity in Tension $\times 10^6$ p.s.i.	29.0	29.0
Structure	Martensitic	Martensitic
Specific Heat, B.t.u./° F./lb. 32-212° F.	0.11	0.11
Thermal Conductivity, B.t.u./sq. ft./hr./° F./ft. (212° F. 932° F.)	14.4 16.6	14.4 16.6
Mean Coefficient of Thermal Expansion per ° F. $\times 10^{-6}$	5.5 5.6 6.4 6.5	5.5 5.6 6.4 6.5
Melting Point Range	2700-2790° F.	2700-2790° F.
<b>ELECTRICAL PROPERTIES</b>		
Magnetic Permeability, Annealed	Ferro-magnetic	Ferro-magnetic
Elec. Resistivity, microhms-cm, 70° F.	57.0	57.0
<b>MECHANICAL PROPERTIES</b>		
Brinell (Annealed Hardness (Heat Treated Bars) Cold Drawn)	135-165 415-180 205	138-160 415-200 205
Rockwell Hardness (Sheet or Strip)	Annealed 75-85 R <sub>B</sub> Heat Treated 30-40 R <sub>C</sub> Cold Rolled	80-90 R <sub>B</sub> 10-30 R <sub>C</sub>
Ultimate Tensile Strength, lbs./sq. in.	Annealed 65,000-85,000 Heat Treated 95,000-200,000 Cold Worked* 100,000	70,000-80,000 90,000-200,000 100,000
Yield Point, lbs./sq. in.	Annealed 35,000-45,000 Heat Treated 60,000-150,000 Cold Worked* 85,000	40,000-50,000 70,000-150,000 85,000
Elongation in 2 inches	Annealed 30-20% Heat Treated 30-10% Cold Worked* 17%	30-20% 22-12% 13%
Reduction of area	Annealed 65-60% Heat Treated 60-25% Cold Worked* 60%	65-60% 55-40% 50%
Impact Strength, Izod Value, Ft. lbs.	Annealed 110-70 Heat Treated 100-20	95-70 60-12
Ductility, Annealed	Olsen, inches .275-.350 Ericksen, mms. 6.75-7.50	
Creep Strength, Life of 10,000 hrs. with 1% Elongation, lbs. per sq. in.	At 1000° F. 13,000 At 1100° F. 5,000 At 1200° F. 2,300 At 1300° F. 1,500	12,500 5,000 2,100 1,400
Strength at Elevated Temps., Short Time Tests, lbs./sq. in.	1300° F. 15,000 1500° F. 9,000 1700° F. 8,500	15,000 8,500 7,500
<b>HEAT TREATMENT</b>		
Full Anneal	Slow Cool from 1550° F. to 1100° F.	Slow Cool from 1550° F. to 1100° F.
Process Anneal	Air Cool from 1300-1400° F.	Air Cool from 1250-1350° F.
Hardening—Quench from	1750-1825° F.	1750-1825° F.
Tempering	400-1300° F.	400-1300° F.
Initial Forging	Start 2150° F. Finish 1500° F.	2200° F. 1500° F.†
<b>HEAT RESISTANCE</b>		
Scaling Temperature	Continuous Service 1250° F. Intermittent Service 1400° F.	1250° F. 1400° F.
<b>WELDING PROPERTIES</b>		
	Fair. Brittle welds. Can be annealed	Poor. Brittle Welds. Likely to crack
<b>MACHINING PROPERTIES</b> , Compared to Bessemer Screw Stock No. B112.		
	About 54%	About 90%
<b>DRAWING OR STAMPING</b>		
	Fairly good.	Fair.

\*These mechanical property values apply to cold rolled sheet or strip in Type 430 and all Type 300 series except Type 303. In Type 303 and all of Type 400 series with the exception of Type 430, these representative mechanical property values apply to annealed and cold drawn one inch diameter bar stock.

†This analysis is designed for machining applications and is not recommended for forging operations requiring severe deformation.



# **TECHNICAL PROPERTIES OF POPULAR GRADES OF STAINLESS STEELS (Continued)**

Grade—Type Number	Type 420	Type 430
<b>PHYSICAL PROPERTIES</b>		
Density, lb./cu. in.	0.28	0.28
Mod. of Elasticity in Tension $\times 10^6$ p.s.i.	29.0	29.0
Structure	Martensitic	Ferritic
Specific Heat, B.t.u./° F./lb. 32-212° F.	0.11	0.11
Thermal Conductivity, B.t.u./sq. ft./hr./° F./ft. $\left\{ \begin{array}{l} 212^\circ \text{ F.} \\ 932^\circ \text{ F.} \end{array} \right.$	14.4	15.1 15.2
Mean Coefficient of Thermal Expansion per ° F. $\times 10^{-6}$ $\left\{ \begin{array}{l} 32-212^\circ \text{ F.} \\ 32-600^\circ \text{ F.} \\ 32-1000^\circ \text{ F.} \\ 32-1200^\circ \text{ F.} \end{array} \right.$	5.7 6.0 6.5 6.8	5.8 6.1 6.3 6.6
Melting Point Range	2650-2750° F.	2600-2750° F.
<b>ELECTRICAL PROPERTIES</b>		
Magnetic Permeability, Annealed	Ferro-magnetic	Ferro-magnetic
Elec. Resistivity, microhms-cm. 70° F.	55.0	60.0
<b>MECHANICAL PROPERTIES</b>		
Brinell Hardness $\left\{ \begin{array}{l} \text{Annealed} \\ \text{Heat Treated} \\ \text{Cold Drawn} \end{array} \right.$ (Bars)	160-190 520-225 215	140-160 185
Rockwell Hardness $\left\{ \begin{array}{l} \text{Annealed} \\ \text{Heat Treated} \\ \text{Cold Rolled} \end{array} \right.$ (Sheet or Strip)	23 RC ..... .....	80-90 RB ..... 90-105 RB
Ultimate Tensile Strength, lbs./sq. in. $\left\{ \begin{array}{l} \text{Annealed} \\ \text{Heat Treated} \\ \text{Cold Worked}^* \end{array} \right.$	95,000 120,000-220,000 105,000	70,000-90,000 90,000-130,000
Yield Point, lbs./sq. in. $\left\{ \begin{array}{l} \text{Annealed} \\ \text{Heat Treated} \\ \text{Cold Worked}^* \end{array} \right.$	50,000 85,000-210,000 85,000	40,000-55,000 65,000-130,000
Elongation in 2 inches $\left\{ \begin{array}{l} \text{Annealed} \\ \text{Heat Treated} \\ \text{Cold Worked}^* \end{array} \right.$	25% 20-7% 17%	30-20% 20-2% .....
Reduction of Area $\left\{ \begin{array}{l} \text{Annealed} \\ \text{Heat Treated} \\ \text{Cold Worked}^* \end{array} \right.$	55% 60-25% 50%	55-40% ..... .....
Impact Strength, Izod Value, Ft. lbs. $\left\{ \begin{array}{l} \text{Annealed} \\ \text{Heat Treated} \end{array} \right.$	80-70 60-10	50-5 .....
Ductility, Olsen, inches $\left\{ \begin{array}{l} \text{Annealed} \\ \text{Ericksen, mms.} \end{array} \right.$	..... .....	275-350 6.75-8.50
Creep Strength, Life of 10,000 hrs. with 1% Elongation, lbs. per sq. in. $\left\{ \begin{array}{l} \text{At } 1000^\circ \text{ F.} \\ \text{At } 1100^\circ \text{ F.} \\ \text{At } 1200^\circ \text{ F.} \\ \text{At } 1300^\circ \text{ F.} \end{array} \right.$	..... ..... ..... .....	8,500 5,000 2,000 1,300
Strength at Elevated Temps., Short Time Tests, lbs./sq. in. $\left\{ \begin{array}{l} 1300^\circ \text{ F.} \\ 1500^\circ \text{ F.} \\ 1700^\circ \text{ F.} \end{array} \right.$	26,500 13,500 9,000	15,000 8,000 5,000
<b>HEAT TREATMENT</b>		
Full Anneal	Slow Cool from 1550-1650° F.	Air Cool from 1400-1500° F.
Process Anneal	Air Cool from 1250-1350° F.	Same as full
Hardening—Quench from	1800-1900° F.	Non-hardening
Tempering	300-700° F.	Non-hardening
Initial Forging $\left\{ \begin{array}{l} \text{Start} \\ \text{Finish} \end{array} \right.$	2000-2100° F. (Retard cooling)	1950° F. 1400° F.
<b>HEAT RESISTANCE</b>		
Scaling Temperature $\left\{ \begin{array}{l} \text{Continuous Service} \\ \text{Intermittent Service} \end{array} \right.$	..... .....	1500° F. 1600° F.
<b>WELDING PROPERTIES</b>		
	Fair, Preheat 400-500° F. Anneal 1300° F. after welding.	Fair, Brittle welds. Slight response to annealing.
<b>MACHINING PROPERTIES, Compared to Bessemer Screw Stock No. B1112</b>		
	About 54%	About 54%
<b>DRAWING OR STAMPING</b>		
	Fair	Fairly good.

\*These mechanical property values apply to cold rolled sheet or strip in Type 430 and all Type 300 series except Type 303. In Type 303 and all of Type 400 series with the exception of Type 430, these representative mechanical property values apply to annealed and cold drawn one inch diameter bar stock.

MONEL-NICKEL

GENERAL

OKLAHOMA



# **TECHNICAL PROPERTIES OF POPULAR GRADES OF STAINLESS STEELS (Continued)**

Grade—Type Number	Type 440-C	Type 446
<b>PHYSICAL PROPERTIES</b>		
Density, lb./cu. in.	0.28	0.27
Mod. of Elasticity in Tension×10 <sup>6</sup> p.s.i.	29.0	29.0
Structure	Martensitic	Ferritic
Specific Heat, B.t.u./° F./lb. 32-212° F.	0.11	0.12
Thermal Conductivity, (212° F. B.t.u./sq. ft./hr./° F./ft. 1932° F.	14.0	12.1 14.1
Mean Coefficient of Thermal Expansion per ° F.×10 <sup>-6</sup> 32-212° F. 32-600° F. 32-1000° F. 32-1200° F.	5.6 ..... ..... .....	5.8 6.0 6.2 6.4
Melting Point Range	2500-2700° F.	2600-2750° F.
<b>ELECTRICAL PROPERTIES</b>		
Magnetic Permeability, Annealed	Ferro-magnetic	Ferro-magnetic
Elec. Resistivity, microhms-cm, 70° F.	60.0	67.0
<b>MECHANICAL PROPERTIES</b>		
Brinell Hardness { Annealed Heat Treated (Bars) Cold Drawn	210-250 600-275 260	140-185 ..... 185
Rockwell Hardness { Annealed (Sheet or Strip) Heat Treated Cold Rolled	..... ..... .....	78-90 R <sub>B</sub> ..... .....
Ultimate Tensile Strength, lbs./sq. in. { Annealed Heat Treated Cold Worked*	110,000 130,000-265,000 125,000	75,000-95,000 ..... 85,000
Yield Point, lbs./sq. in. { Annealed Heat Treated Cold Worked*	65,000 110,000-250,000 100,000	45,000-60,000 ..... 70,000
Elongation in 2 inches { Annealed Heat Treated Cold Worked*	10-15% 12-20% 7% .....	30-20% ..... 20% .....
Reduction of Area { Annealed Heat Treated Cold Worked*	30% 20-2% 20% .....	50-40% ..... 45% .....
Impact Strength, Izod Value, ft. lbs. { Annealed Heat Treated	20-5 8-3	8-2 .....
Ductility, Annealed { Olsen, inches Ericksen, mms.	..... .....	250-300 6-5
Creep Strength, Life of 10,000 hrs. with 1% Elongation, lbs. per sq. in. { At 1000° F. At 1100° F. At 1200° F. At 1300° F.	..... ..... ..... .....	6,000 3,000 1,500 700
Strength at Elevated Temps., Short Time Tests, lbs./sq. in. { 1300° F. 1500° F. 1700° F.	30,500 17,000 16,500	18,000 9,000 5,000
<b>HEAT TREATMENT</b>		
Full Anneal	Slow Cool from 1550-1650° F.	Air Cool from 1500-1600° F.
Process Anneal	Air Cool from 1250-1350° F.	Same as full
Hardening—Quench from	1850-1950° F.	Non-hardening
Tempering	300-800° F.	Non-hardening
Initial Forging { Start Finish	1900-2100° F. (Retard cooling)	1950° F. 1400° F.
<b>HEAT RESISTANCE</b>		
Scaling Temperature { Continuous Service Intermittent Service	..... .....	1900° F. 2000° F.
<b>WELDING PROPERTIES</b>		
	Not recommended	Fair, Brittle welds. Slight response to annealing.
<b>MACHINING PROPERTIES, Compared to Bessemer Screw Stock No. B1112</b>		
<b>DRAWING OR STAMPING</b>	About 30%	About 40%
	Not recommended	Fair

\*These mechanical property values apply to cold rolled sheet or strip in Type 430 and all Type 300 series except Type 303. In Type 303 and all of Type 400 series with the exception of Type 430, these representative mechanical property values apply to annealed and cold drawn one inch diameter bar stock.

## TECHNICAL PROPERTIES OF ARMCO 17-4 PH BAR AND WIRE

CHEMICAL COMPOSITION	Metal	Content
	Carbon Manganese Phosphorus Sulfur Silicon Chromium Nickel Copper Columbium plus Tantalum	0.07% Max. 1.00% Max. 0.04% Max. 0.03% Max. 1.00% Max. 15.50-17.50% 3.00-5.00% 3.00-5.00% 0.25-0.45%

MECHANICAL PROPERTIES	Cond. A Annealed 1900 F. ½ Hr. oil quench	Cond. H875 Hardened 875 F. 1 Hr. air-cooled	Cond. H1000 Hardened 1000 F. 4 Hrs. air-cooled	Cond. H1100 Hardened 1100 F. 4 Hrs. air-cooled	Cond. H1200 Hardened 1200 F. 4 Hrs. air-cooled
	Room Temperature	Armco 17-4PH can be heat treated at different temperatures to develop various properties. Fully hardened 17-4PH will have a minimum tensile strength of 180,000 psi and minimum yield strength of 165,000 psi. Typical properties for various conditions are shown below:			
Ultimate Strength, psi	135-165,000	180-210,000	170,000	150,000	145,000
Tension		160-180,000			
Torsion					
0.2% Yield Strength, psi	95-125,000	165-200,000	160,000	140,000	95,000
Tension	95-125,000	165-200,000			
Compression					
Endurance strength, psi		90,000	87,500	82,000	
10 million cycles		80,000			
100 million cycles					
Elongation in 2", %	6-15	8-17	14	17	17
Reduction of Area, %	30-60	30-60	55	58	
Izod impact, foot lbs.		10-40	30	40	50
Hardness					
Rockwell		C40-45	C37	C35	C30
Brinell		375-444	375		
Modulus of Elasticity		28,500,000			
Tension		10,500,000			
Torsion					

PHYSICAL PROPERTIES	Condition A (Magnetic)	Condition H875 (Magnetic)
	Density, grams per cu. cm. lbs. per cu. inch	7.78 .280
Electrical Resistivity, microhm-cm.	98	77
Magnetic Permeability at 100 oersteds at 200 oersteds Maximum	74 48 95	100 60 151
Mean Coefficient of Thermal Expansion 10 <sup>-6</sup> inches per inch per degree F. 70-200 F. 70-400 F. 70-600 F. 70-800 F.	6 6 6.2 6.3	6 6.1 6.3 6.5
Thermal Conductivity Btu per hr. per sq. ft. per inch per ° F. at 300 F. 500 F. 860 F. 900 F.		124 135 156 157

Shear strenght - Approximately 70% of Ultimate strength.

Note: For additional information on 17-4 PH Bar and Wire, call our nearest warehouse or sales office.

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## TECHNICAL PROPERTIES OF ARMCO 17-7 PH BAR AND WIRE

CHEMICAL COMPOSITION	Metal		Content	
	Carbon		0.09% Max.	
	Manganese		1.00% Max.	
	Phosphorus		0.04% Max.	
	Sulfur		0.03% Max.	
	Silicon		1.00% Max.	
	Chromium		16.00-18.00%	
	Nickel		6.50-7.75%	
	Aluminum		.75-1.50%	

MECHANICAL PROPERTIES	Bar and Wire		Wire	Bar
	Cond. A	Cond. T	Cond. TH 1050	Cond. TH 1050
Tensile Strength, psi				
Typical	130,000	145,000	200,000	125,000
Minimum	150,000*	125,000	180,000	170,000
0.2% Yield Strength, psi				
Typical	40,000	100,000	185,000	155,000
Minimum	55,000	75,000	150,000	140,000
Elongation in 2", %				
Typical	30.0	9.0	9.0	12.0
Minimum	20.0	4.0	6.0	7.0
Endurance Strength, % of Tensile Strength				
Machined and Polished Surfaces				
10 <sup>7</sup> cycles	.....	.....	40%	44%
10 <sup>8</sup> cycles	.....	.....	37%	41%

PHYSICAL PROPERTIES				
Density				
Grams per cu. cm.	7.81	.....	7.65	7.67
Lbs. per cu. in.	0.282	.....	0.276	0.277
Electrical Resistivity				
Microhm per cm.	81.0	.....	85.0	83.8
Magnetic Permeability				
100 oersteds	.....	.....	90-110	70
200 oersteds	.....	.....	53-63	43.5
Maximum	.....	.....	175-260	125
Mean Coefficient Thermal Expansion				
×10 <sup>6</sup> in. per in. per degree F.				
70-200 F.	8.5	.....	5.5	6.1
70-400 F.	9.0	.....	5.8	6.2
70-600 F.	9.5	.....	5.9	6.4
70-800 F.	9.6	.....	6.1	6.6
†Thermal Conductivity				
Btu per hr. per sq. ft. per in., per degree F.				
at 300 F.	.....	.....	117	114
500 F.	.....	.....	128	127
850 F.	.....	.....	146	150
900 F.	.....	.....	146	151

\* Maximum

Poisson's Ratio .27-.28

† Results of Single Test

Note: For additional information on 17-7 PH Bar and Wire, call our nearest warehouse or sales office.



## TECHNICAL PROPERTIES OF ARMCO 17-7 PH SHEET, STRIP AND PLATE

CHEMICAL COMPOSITION	Metal			Content		
	Carbon Manganese Phosphorus Sulfur Silicon Chromium Nickel Aluminum			0.09% Max. 1.00% Max. 0.04% Max. 0.03% Max. 1.00% Max. 16.00-18.00% 6.50-7.75% .75-1.50%		
MECHANICAL PROPERTIES	Cond. A	Cond. T	Cond. TH 950	Cond. TH 1050	Cond. C	Cond. CH 900
	Tensile Strength, psi Typical Minimum	130,000 150,000*	145,000 125,000	215,000 185,000	200,000 180,000	215,000 200,000
0.2% Yield Strength, psi Typical Minimum	40,000 55,000*	100,000 75,000	200,000 165,000	185,000 150,000	185,000 175,000	240,000 230,000
Elongation in 2", % Sheet and Strip Typical Minimum Plate Typical Minimum	30.0 20.0 30.0 20.0	9.0 4.0 9.0 4.0	8.0 6.0 6.0 3.0	9.0 6.0 9.0 6.0	2.0 1.0 † †	1.0 1.0 † †
Rockwell Hardness, Typical Endurance Limit, Typical % of Tensile Strength Heat treated surface Ground surface, 120 grit Pickled surface Vapor blasted surface	B85 ..... ..... ..... ..... .....	C31 ..... ..... ..... ..... .....	C45 ..... 40 29 40	C43 ..... 40 29 40	C43 ..... ..... ..... ..... .....	C49 ..... 31± 31± 31± .....
Compression 0.2% Yield Strength, % of Tensile Yield Strength Long. Trans.	..... ..... ..... .....	..... ..... ..... .....	..... ..... 110 110	..... ..... 110 110	..... ..... 80 115	..... ..... 93 108
PHYSICAL PROPERTIES						
Density Grams per cu. cm. lbs. per cu. cm.	7.81 0.282	..... .....	7.65 0.276	7.65 0.276	..... .....	7.67 0.277
Electrical Resistivity Microhm per cm.	81.0	.....	87.0	85.0	.....	83.8
Magnetic Permeability 100 oersteds 200 oersteds Maximum	..... ..... .....	..... ..... .....	85-100 50 130-165	90-110 53.63 175.260	..... ..... .....	70 43.5 125
Mean Coefficient Thermal Expansion×10 <sup>6</sup> in. per in. per degree F. 70-200 F. 70-400 F. 70-600 F. 70-800 F.	..... 8.5 9.0 9.5 9.6	..... ..... ..... ..... .....	..... 5.6 6.0 6.1 6.2	..... 5.5 5.8 5.9 6.1	..... ..... ..... ..... .....	6.1 6.2 6.4 6.6
§Thermal Conductivity Btu per hr. per sq. ft. per in. per degree F. at 300 F. 500 F. 850 F. 900 F.	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... 117 128 146 146	..... ..... ..... ..... .....	..... ..... ..... ..... .....	114 127 150 151

\*Maximum      †Fatigue Strength at 10<sup>7</sup> cycles      Poisson's Ratio .27-.28

†Not Produced      §Results of Single Test

Note: For additional information on 17-7 PH Sheet, Strip and Plate,  
call our nearest warehouse or sales office.

Technical information on 17-14 cu-mo furnished on request.

Technical information on 17-10 P (precipitation-hardening grade)  
furnished on request.

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## CUTTING RATES FOR STAINLESS STEELS

Description	Type Numbers					
	403* 405 410*	416*	420 420F†	430	430F	414* 431
Brinell Hardness Ranges on which the following rates are based.	180-240	180-240	180-230	170-230	170-230	230-280

Cutting Rates in Surface Feet Per Minute						
Automatic Screw Machine	90-100	120-150	80-100	90-100	120-150	80-100
Heavy Duty Single or Multiple Spindle	80-100	110-130	60-80	80-100	110-130	70-90
Turret Lathe	80-100	100-130	60-80	80-100	110-130	70-90
Based on Tungsten or Moly High-Speed Tooling. Rates may be increased 15-30% with High-Cobalt or Cast Alloys.						
Automatic Screw Machine (Swiss type)	110-140	120-150	90-120	110-140	120-150	100-140
Based on Cast Alloy or Carbide Tooling						
Milling	40-60	50-80	30-50	40-60	50-80	40-60
Reaming						
Smooth finish at .003"/.0075" Feed	15-40	15-40	15-40	15-40	15-40	15-40
Work Sizing at .003"/.0075" Feed Based on Tungsten or Moly High-Speed Tooling. Greatly increased rates obtainable with Carbide tooling.	40-120	40-120	40-120	40-120	40-120	40-120
Threading	10-25	10-25	10-25	10-25	10-25	10-25
Tapping	10-25	10-25	10-25	10-25	10-25	10-25
Drill Press	40-80	60-90	30-50	40-80	60-90	40-60
Based on Tungsten or Moly High-Speed Tooling.						
Single Point Turning						
Carbide Tooling						
Roughing	150-200	150-200	100-150	150-200	150-200	140-180
Finishing	200-400	200-400	150-250	200-400	200-400	150-350
High Cobalt or Cast Alloy Tooling						
Roughing	100-130	100-150	80-100	100-130	100-150	90-120
Finishing	100-150	150-200	100-150	100-150	150-200	90-140
Tungsten or Moly High-Speed Alloy Tooling						
Roughing	80-100	80-100	60-80	80-100	80-100	60-80
Finishing	80-130	100-150	80-120	80-130	100-150	80-100

\*Harder Stock in the Brinell Range of 260-320 may be machined by reducing these speeds approximately 20%.

†When using automatic screw machine equipment, the free machining type allows an increase of about 10% over the cutting rates shown.

For additional information on machining Stainless Steel, ask for the following literature:

"Machining of Armco Stainless Steels"; "Where and How to use Carbides in Machining Stainless Steel"; "Machining Capacities for Machining Armco Stainless Steel".

# DATA

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Type Numbers

440A 440B 440C 440F†	446	301 302 304 304L	303	309-309S 310-310S 316-316L	321 347	347F	17-4PH	17-7PH
200-265	170-230	150-250	150-240	150-240	150-240	150-240	300-360	150-240

Cutting Rates in Surface Feet Per Minute

60-80 50-70 50-70	80-100 60-80 60-80	70-90 60-80 60-80	100-130 90-120 90-120	60-80 60-80 60-80	70-90 60-80 60-80	90-110 80-100 80-100	60-80 50-70 50-70	60-80 50-70 50-70
60-100	100-140	80-120	110-130	80-120	80-120	100-120	80-120	80-120
30-50 15-40 40-120	40-60 15-40 40-120	40-60 15-40 40-80	40-60 15-40 40-120	30-50 15-40 40-80	40-60 15-40 40-80	40-60 15-40 40-80	40-60 15-40 40-80	40-60 15-40 40-80
10-25 10-25 30-50	10-25 10-25 40-60	10-25 10-25 30-50	10-25 10-25 50-80	10-25 10-25 30-50	10-25 10-25 30-50	10-25 10-25 30-50	10-25 10-25 40-60	10-25 10-25 40-60
100-150 150-200 60-80 80-100 40-60 60-80	140-180 150-350 100-130 100-150 60-90 90-120	130-180 150-300 100-130 100-150 60-90 100-120	150-250 200-400 100-150 100-150 70-90 100-140	130-180 150-300 100-130 100-150 60-90 100-120	130-180 150-300 100-130 100-150 60-90 100-120	150-250 200-400 100-140 140-190 60-90 100-130	130-180 150-300 100-130 100-150 60-90 100-120	130-180 150-300 100-130 100-150 60-90 100-120

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GENERAL



### TUBING - CARBON STEELS A.I.S.I. 1015

	Yield Point	Ultimate Strength	Elonga- tion % in 2 inches	Equiv- alent Rockwell	Equiv- alent Brinell
HOT ROLLED	33,000	55,000	40	B-64	107
NORMALIZED	35,000	50,000	40	B-57	97
RETORT ANNEALED	28,000	48,000	45	...	...
SOFT ANNEALED	30,000	48,000	40	...	...
MEDIUM ANNEALED	40,000	65,000	30	B-73	128
FINISH ANNEALED	55,000	75,000	20	B-81	149
HARD DRAWN	67,000	80,000	15	B-84	159
C. .10-.20	MN. .30-.60	P. .045 max.	S. .055 max.		

The regular grade of mechanical tubing carried in stock is of A.I.S.I. 1015 analysis. It is recommended for general use. Its carburizing qualities are good. The general machining qualities are good, but, for special requirements, the tubing can be treated to develop improved machinability.

### INTERNATIONAL NICKEL COMPANY ALLOYS

Inco alloys and the special products of the International Nickel Company are a group of rustproof, corrosion resisting metals that are stronger than structural carbon steel and readily fabricated by all the usual methods, including hot and cold forming, machining, welding and soldering.

Because they are rustproof and resistant to many corrosives, these metals are used in a wide variety of chemical equipment to protect the purity of the product, to obtain long life and to minimize maintenance expense. In mechanical equipment they are used to obtain more dependable operation and to eliminate troubles resulting from rust and corrosion, particularly in parts that must have good strength, stiffness and resistance to wear. In appearance applications they are used to obtain durability and attractiveness. Since their mechanical strength is not much affected by extremes in temperatures, they are used for such purposes as quick freezing equipment and for high pressure steam valves.

*Continued on next page*

# DATA

## INTERNATIONAL NICKEL COMPANY ALLOYS (Continued)

Monel, Nickel and other products in the hot rolled form are stronger and much tougher than the hot rolled structural carbon steel used in the construction of buildings and bridges. The strength and hardness of all our mill products may be increased by cold working, but Monel, Nickel and Inconel are not susceptible to thermal hardening. However, the special products "K" Monel, Duranickel, and Permanickel, can be hardened by heat treatment, the properties obtained comparing favorably with heat treated alloy steels. The special alloy "S" Monel can also be heat treated, hardnesses being obtained that are comparable to low carbon white iron used in pulverizing equipment for high abrasion resistance.

Monel and Nickel are stronger and tougher than other non-ferrous metals commonly used to avoid rust and for corrosion-resisting purposes. Since they are not only stronger, but much more rigid than copper, aluminum and such materials, they are better adapted to structural applications. Since elevated temperature has less effect on their strength and stiffness, they offer advantages in steam power equipment and other apparatus operated at temperatures above normal. For bearing purposes, "S" Monel has excellent resistance to galling and has high compressive strength.

You who have problems in choosing the best alloy to use under given conditions may obtain assistance by calling our nearest warehouse or sales office. This help may come direct from our representative, through technical literature, or, if necessary, from a member of the International Nickel Company's technical staff. The services of Inco's Development and Research Division are available free of charge. This division has first-hand experience, and has developed a vast library of field data.

MONEL-NICKEL

GENERAL

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## MONEL

New Designation:

**MONEL alloy 400**

### Nominal Composition in %

NICKEL	66.00	SILICON	0.15
COPPER	31.50	CARBON	0.12
IRON	1.35	SULPHUR	0.005
MANGANESE	.90		

Monel possesses the unusual combination of steel-like strength and toughness with complete immunity to rust and high resistance to a long list of corrosives under varying conditions, including salt, lye, sulfuric acid and others commonly encountered.

Strong, corrosion-resistant Monel assures longer equipment life. Its corrosion resistance protects the purity, taste and color of commodities such as salt, food stuffs, pharmaceuticals and various chemical products. It has many mechanical applications such as high speed propeller shafting. It has become almost a standard material for salt water applications under most conditions.

Monel is widely used in petroleum production and refining equipment, in such forms as condenser tubes, bubble caps, tank linings, piping, valves, polish rods and liners, pump rods, work boards in bottom hole petroleum field equipment, etc.

In the rapidly expanding field of off-shore oil drilling, Monel has proved its worth as a sheathing material to protect the steel piling from salt water corrosion at the tide level zone. This application has been extended to include the structures housing our country's off-shore radar warning system.



An off-shore oil drilling rig. Monel sheathing protects its steel piling from salt water corrosion at the tide level zone.



## "K" MONEL

New Designation:

**MONEL alloy K-500**

**Extra Strength and Hardness  
(through heat treatment)**

**Non-Magnetic**

### Nominal Composition in %

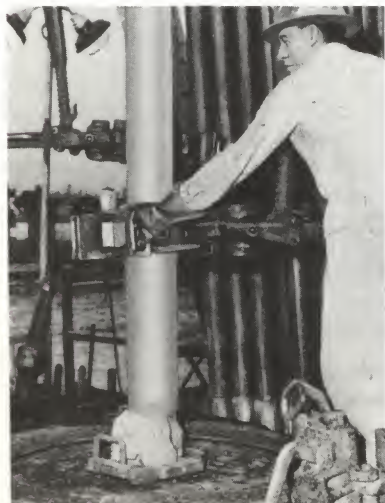
NICKEL	65.30	MANGANESE	0.60
COPPER	29.50	CARBON	0.15
ALUMINUM	2.80	SILICON	0.15
IRON	1.00	SULPHUR	0.005
TITANIUM	0.50		

"K" Monel possesses the rustproof, corrosion-resistant characteristics of Monel and through heat treatment develops strength and hardness comparable to the alloy steels used in high strength airplane engine crankshafts. Prior to heat treatment, it may be formed and welded with the same ease as Monel.

Because of its high strength and corrosion-resistance, it is used as shafting for pumps handling salt water, acid treated petroleum and other corrosive liquids. Its hardness and wear resistance suit it for scraper blades, seats and discs of valves, and wearing sleeves.

Generally, in the oil production field only two corrosives are encountered, salt water and hydrogen sulphide. "K" Monel has been found very useful in such media. Because of its non-magnetic properties and corrosion resistance, "K" Monel is an excellent material for drill collars in directional drilling equipment where sensitive instruments are involved. Important applications are; seats in ball and cage valves (on working barrel of bottom hole equipment), sucker rods, and gas lift valves. In oil refineries "K" Monel stud bolts have found extensive use in HF Alkylolation systems.

Large sluice-gate stems of hammer forged and heat treated "K" Monel, up to 8½ inches diameter x 20 feet, are used in several of the country's largest dams, because it is possible to obtain higher strength than in other non-corrosive metals.



**A "K" Monel drill collar being lowered into hole. This drill collar is about 20 feet long.**

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GENERAL

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# DATA

## "R" MONEL

New Designation:  
**MONEL alloy R-405**

**For High Speed Machining**

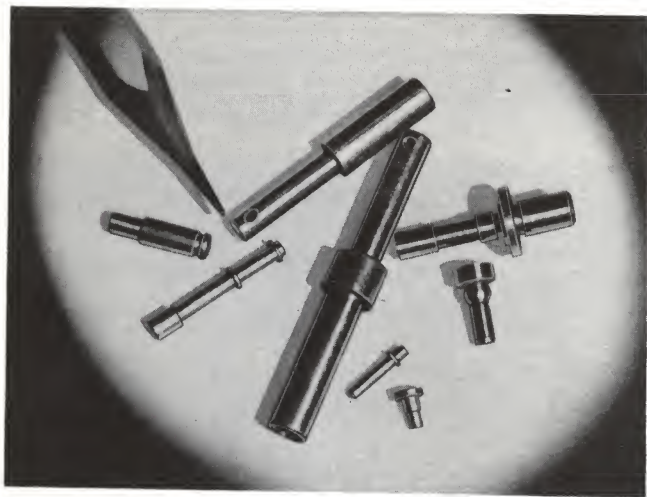
### Nominal Composition in %

NICKEL	65.95	SILICON	0.15
COPPER	31.50	CARBON	0.18
IRON	1.35	SULPHUR	0.050
MANGANESE	0.90		

"R" Monel has the free-cutting qualities required for high-speed automatic machine work and at the same time provides the corrosion resistance and immunity to rust inherent in Monel.

Its strength is equal to the best available steel screw stock and it may be readily fabricated by cold-forming operations such as cold-heading and bending. Being red short, it is not recommended for hot-upsetting or other hot-forming operations.

"R" Monel is used for parts of regulators, gas lift valves, and other applications requiring a high degree of corrosion resistance and immunity to rusting.



Precision machine parts made with "R" Monel. It is possible to maintain extremely close tolerances with "R" Monel.

# DATA

## "KR" MONEL

New Designation:  
**MONEL alloy 501**

For Improved Machinability

### Nominal Composition in %

Same as "K" Monel, except  
carbon content of 0.23  
and nickel 65.20

"KR" Monel is an age-hardenable alloy similar to "K" Monel, but with better machinability. It has essentially the same chemical composition, corrosion resistance, mechanical and physical properties as "K" Monel; and is recommended for parts requiring intricate machining.

"KR" Monel that has not been age-hardened (i.e., "as rolled", "as drawn", or quenched) can be machined, using the tools, tool design and cutting lubricants normally used for "K" Monel, but at the machining speeds used for Monel. For automatic machining of "KR" Monel, cutting speeds of 60 to 80 feet per minute may be used with the corresponding feeds normally used for machining-quality "R" Monel.

## "A" NICKEL

New Designation:  
**NICKEL 200**

For Processing Pure Products

### Nominal Composition of "A" Nickel

NICKEL	99.45	SILICON	0.05
COPPER	0.05	CARBON	0.06
IRON	0.15	SULPHUR	0.005
MANGANESE	0.25		

NOTE: Nominal Composition of Low Carbon Nickel is same as "A" Nickel except carbon content of .01, Manganese .20 and Nickel 99.55.

Nickel is a pure metal with high strength and corrosion resistance. It has many applications in the food and chemical industries where the protection of purity, color, odor and flavor are essential.

The outstanding resistance of nickel to molten concentrated caustic soda (lye) accounts for its extensive use in both the production and consumption of pure caustic soda. Nickel-clad collandrias for the sugar industry represent a new wide use. Nickel also has proved valuable in chlorinated hydrocarbon processing equipment.



**DURANICKEL**

New Designation:

**DURANICKEL alloy 301****Excellent Spring Properties  
in a Rustproof Metal****Nominal Composition in %**

NICKEL	93.90	ALUMINUM	4.50
COPPER	0.05	SILICON	0.55
MANGANESE	0.25	CARBON	0.15
IRON	0.15	SULPHUR	0.005
TITANIUM	0.45		

This alloy, in addition to having the corrosion resistance of nickel, may be hardened through heat treatment; and will develop strength comparable to the oil tempered steel commonly used for springs.

Duranickel, like "K" Monel, may be hardened after fabrication. In the unhardened condition, it may be bent, drawn, machined and stamped almost as easily as nickel.

In oil refineries, Duranickel stud bolts are used extensively in HF Alkylation systems.

Duranickel springs made from both wire and strip have good resistance to fatigue, and at room temperatures are performing well under many corrosive conditions. Some applications are laundry clips, jewelry parts, optical frames, springs in sunlamps and spark plugs, and shaker springs on fourdriniers in paper mills. Duranickel springs in electric toasters operate effectively up to 600° F.

Its use as instrument parts include diaphragms, bellows, flapper valve discs, snap switch blades, and hands and numbers on watches used by the blind.

In the sports field, Duranickel is used for trolling wire, fish hooks and other parts of fishing tackle.

Duranickel "R" is a machining grade of Duranickel. Its chemical composition, mechanical properties, and corrosion characteristics are essentially the same as those of Duranickel.



**Springs of Duranickel are corrosion-resistant as commercially pure nickel, and as stiff, hard, and strong as heat treated alloy steel springs.**

## PERMANICKEL

New Designation:

**PERMANICKEL alloy 300**

### Nominal Composition in %

NICKEL	98.00	SILICON	0.10
COPPER	0.05	TITANIUM	0.40
MANGANESE	0.10	MAGNESIUM	0.30
IRON	0.10	CARBON	0.25
SULPHUR	0.005		

Permanickel is an age-hardenable alloy having the same mechanical properties and resistance to corrosion as Duranickel, but different physical constants. It is preferred to Duranickel in a few services, such as springs requiring high electrical conductivity, and magnetostrictive units which are operated under stress conditions for which the fatigue strength of nickel is inadequate.

## INCONEL

New Designation:

**INCONEL alloy 600**

**Heat Resistant — Corrosion  
Resistant**

### Nominal Composition in %

NICKEL	76.40	MANGANESE	0.20
CHROMIUM	15.85	SILICON	0.20
COPPER	0.10	CARBON	0.04
IRON	7.20	SULPHUR	0.007

Inconel combines the corrosion resistance, strength and great toughness of nickel, the basic metal, with the extra resistance to heat and oxidation contributed by chromium.

Inconel's ability to withstand repeated heating and cooling in the range 0°-1600° F., without becoming embrittled, has caused its wide-spread adoption for exhaust manifolds for airplane engines and for sheathing electric heating elements; at temperatures up to 2000° F., it is used for various types of furnace and heat treatment equipment. Thus its chief use is in the high temperature field.

Because of its corrosion resistance, the chemical and allied industries use Inconel equipment for processing fatty acids, pharmaceuticals and organic materials, such as dyestuffs, pure edible oils, and pectin.

Inconel is particularly suitable for food processing equipment — for handling milk, gin, champagne, orange juice, etc., where freedom from contamination or discoloration are main requisites and resistance to corrosive-cooling brines and scouring and sterilizing compounds are important.

## INCONEL "X"

New Designation:

### INCONEL alloy X-750

#### Nominal Composition in %

NICKEL	72.80	ALUMINUM	0.80
CHROMIUM	15.15	SILICON	0.30
IRON	6.75	MANGANESE	0.70
TITANIUM	2.55	COPPER	0.05
COLUMBIUM	0.85	CARBON	0.04
		SULPHUR	0.007

This is an alloy having a low creep-rate under high stresses at 1200°-1500° F. (after suitable thermal treatment), highly resistant to chemical corrosion and oxidation, and suitable for use as springs up to 1000° F. Above 1500°, its creep strength diminishes and its oxidation resistance falls below that of Inconel.

Typical uses include parts of aircraft gas turbines, or other gas turbines, and heat engines that require high strength and a low plastic flow rate at temperatures up to 1500° F.

Complete information is unavailable to date on the mechanical properties of Inconel "X", and it is suggested that you get in touch with our nearest warehouse or sales office for additional technical data.

## INCOLOY

New Designation:

### INCOLOY alloy 800

Heat Resistant — Corrosion  
Resistant

#### Nominal Composition in %

NICKEL	32.50	SILICON	0.35
CHROMIUM	20.50	COPPER	0.30
IRON	45.50	CARBON	0.04
MANGANESE	0.75	SULPHUR	0.007

Incoloy provides a high temperature alloy with good resistance to oxidation, strength at elevated temperatures, and good workability and welding properties.

Because it is a relatively new alloy, Incoloy's corrosion resistance at high temperatures is still under test. In terms of behavior in various high temperature environments, it is anticipated that the alloy, because of its lower nickel content, will be superior to Inconel in its resistance to sulphur attack, "green rot", and molten cyanide salts; comparable to Inconel in resistance to oxidation and in fused neutral salts; and inferior to Inconel in nitriding, halogen gases, and molten caustic.



# DATA

## NI-O-NEL

New Designation:

NI-O-NEL alloy 825

Acid Corrosion Resistant

### Nominal Composition in %

NICKEL	42.50	COPPER	1.80
CHROMIUM	22.50	MANGANESE	0.55
IRON	27.75	SILICON	0.35
MOLYBDENUM	3.10	CARBON	0.03
SULPHUR	0.007	ALUMINUM	0.15
TITANIUM	0.50	COLUMBIUM	0.75

Ni-O-Nel, the newest of the high-nickel Inco alloys, was developed to withstand certain corrosive conditions of unusual severity. It answers a need not filled by any other Inco alloys, in that it has the specific ability to perform well in certain hot acids and oxidizing chemicals as well as in other media.

It is considerably more resistant to reducing conditions — such as hot sulphuric, sulphurous and phosphoric acid solutions than any of the common stainless steels. It is also a good material to use with nitric acid solutions, nitrates, and cupric, ferric and mercuric salts, except chlorides. In view of the generally useful resistance of the stainless steels in many nitric acid solutions, it is probable that Ni-O-Nel will prove valuable in mixtures of nitric with other acids such as nitric-sulphuric, nitric-phosphoric, and some nitric-hydrofluoric solutions.

It performs well in most organic acids. It shows excellent resistance to boiling concentrated acetic acid, acetic-formic acid mixtures, maleic and phthalic acids and other organic acids which are frequently corrosive to stainless steels.

Ni-O-Nel shows particular adaptability for heat exchanger equipment due to the fact that it not only resists a wide range of chemical corrosives, but also performs well with certain troublesome cooling waters. It has shown considerably better resistance than Type 316 Stainless to pitting attack in sea water, and also to stress corrosion cracking in chloride solutions.

Ni-O-Nel is available in all wrought mill forms. Contact our nearest warehouse or sales office and ask for technical bulletin T-37, "Engineering Properties of NI-O-NEL".

# INCO ALLOY PHYSICAL CONSTANTS

## DATA

OLD DESIGNATION	Monel	"K" Monel	"S" Monel	Nickel	Duranickel	Permanickel	Inconel	Inconel "X"	Incoloy
NEW DESIGNATION	MONEL alloy 400	MONEL alloy K-500	MONEL alloy 505	NICKEL 200	DURANICKEL alloy 301	PERMANICKEL alloy 300	INCONEL alloy 600	INCONEL alloy X-750	INCOLOY alloy 800
Density (lb. per cu. in.)	0.319	0.306	0.307-0.318	0.321	0.298	0.316	0.307	0.3	0.29
Melting point (° F.)	2370-2460	2400-2460	2300-2350	2615-2635	2550-2620	.....	2540-2600	2450-2600	2550-2600
Mean specific heat (B.t.u./LB./° F.)	0.127	0.127	0.127	0.130A	0.104	.....	0.109B	0.10-0.11	.....
Mean coefficient of thermal expansion (in./in./° F.)	0.0000078	0.0000078	0.0000082C	0.0000074A	0.0000072	0.0000072	0.0000078E	.000009G	.0000101G
70°-212° F.	0.0000089	0.0000089	0.0000087D		.....	.....			
70°-1100° F.									
Thermal conductivity (B.t.u./Sq. Ft./Hr./° F./In.)	180A	130B	180A	420A	128/137*	400	104A	85/196H	95A
Electrical Resistivity (Ohms/Mil Ft.)	290(68° F.)	350(32° F.)	380(32° F.)	57(32° F.)	280/260*(32° F.)	100/94.5*	590(32° F.)	750(122° F.)	.....
Electrical Resistivity Temp. Coef. (Per ° F.)	0.0011	0.000106	.....	0.0022-0.0028	.0006	.002	.....	.....	.....
Magnetic Transformation Temp. ° F.	Variable	Below 110°	.....	680	60-120/200*	600/563*	.....	280	.....
Modulus of Elasticity (Million PSI) In Tension	26	26	21	30	30	30	31	31	31
In Torsion	9.5	9.5	.....	11	11	11	11	11	.....
A—80°-212° F. B—77°-212° F.		C—70°-600° F. D—70°-1000° F.		E—100°-200° F.		G—100°-1500° F.		H—112°-1472° F.	

\*First figure applies to soft condition; the second, to age-hardened condition.

NOTE: MONEL alloy R-405 physical constants are substantially the same as Monel alloy 400.  
MONEL alloy 501 physical constants are substantially the same as Monel alloy K-500.

## INCO ALLOYS MECHANICAL PROPERTIES

The values listed indicate only the minimum and maximum properties available over the complete range of tempers and sizes for each product. More detailed information is available on request.

Metal and Form	Strength		Ductility	Hardness		Toughness
	Tensile Strength 1000 Psi	Yield Strength (0.2% Offset) 1000 Psi		Brinell 3000 Kg.	Rockwell Range	
MONEL ALLOY 400						
Rods, Bars, Forgings	70-125	25-120	50-5	110-250	60B-23C	120-75
Sheet	65-120	23-110	50-2	.....	60B-93B	.....
Strip	70-140	25-130	50-2	.....	60B-98B	.....
Plate	70-90	28-60	50-30	110-170	60B-98B	.....
Tubing	65-130	25-120	50-3	.....	60B-27C	.....
Wire	70-170	25-165	50-2	.....	.....	.....
NICKEL 200						
Rods, Bars, Forgings	55-110	15-100	55-10	90-230	45B-98B	.....
Sheet	55-115	15-105	50-2	.....	70B-90B	.....
Strip	55-130	15-115	50-2	.....	64B-95B	.....
Plate	55-85	15-50	60-35	99-150	45B-80B	.....
Tubing	55-115	15-105	60-10	.....	65B-105B	.....
Wire	50-165	10-150	50-2	.....	.....	.....
INCONEL ALLOY 600						
Rods, Bars, Forgings	80-150	25-125	55-10	120-290	65B-30C	120-70
Sheet	80-150	30-125	55-2	.....	65B-24C	.....
Plate	80-110	30-65	55-30	120-210	65B-95B	.....
Strip	80-170	30-160	55-2	.....	84B-30C	.....
Tubing	80-160	30-140	55-2	.....	88B-34C	.....
Wire	80-185	25-175	55-2	.....	.....	.....

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# INCO ALLOYS MECHANICAL PROPERTIES (Continued)

Metal and Form	Strength		Ductility	Hardness		Toughness
	Tensile Strength 1000 Psi	Yield Strength (0.2% Offset) 1000 Psi		Brinell 3000 Kg.	Rockwell Range	
<b>MONEL alloy K-500</b>						
Rods, Bars, Forgings	90-180	40-150	45-13	140-330	75B-37C	.....
Sheet and Strip	90-200	40-180	45-3	.....	75B-40C	.....
Tubing	90-200	40-180	45-2	.....	75B-40C	.....
Wire	90-210	40-190	45-2	.....	.....	.....
<b>MONEL alloy 501</b>						
Rods	90-180	40-150	45-13	140-340	75B-37C	.....
<b>MONEL alloy R-405</b>						
Rods	75-115	35-100	45-15	130-240	.....	.....
<b>DURANICKEL alloy 301</b>						
Rods, Bars	90-210	30-175	55-15	135-380	75B-42C	120-25
Strip	90-230	35-60	50-2	.....	90B-46C	.....
Wire	90-240	.....	50-2	.....	.....	.....
<b>INCOLOY alloy 800</b>						
Rods, Bars, Forgings	75-120	30-125	50-10	120-290	66B-30C	.....
Sheet	75-100	30-55	55-30	.....	88B (Max.)	.....
Strip	75-100	30-55	55-30	.....	84B (Max.)	.....
Plate	75-120	30-90	50-25	120-220	.....	.....
Tubing	75-100	30-55	50-30	.....	88B (Max.)	.....
Wire	75-105	25-55	50-25	.....	.....	.....
<b>CLAD STEEL PLATES</b>						

Unless otherwise specified, the steel layer of Clad Steel Plate is low-carbon Flange quality with minimum tensile strength of 55,000 Psi and minimum yield strength of 27,500 Psi. In the composite metal of steel and nickel, Monel or Inconel, the cladding metal contributes additional strength, generally increasing the ultimate tensile strength by from 500-5000 Psi.

Continued on next page

## INCO ALLOYS MECHANICAL PROPERTIES (Continued)

Metal and Form	Strength		Ductility	Hardness		Toughness
	Tensile Strength 1000 Psi	Yield Strength (0.2% Offset) 1000 Psi		Brinell 3000 Kg.	Rockwell Range	
<b>Castings</b>						
Monel	65-80	32.5-40	45-25	125-150	55B-72B	80-65
Nickel	55-70	20-30	30-15	100-130	.....	.....
"S" Monel	110-145	80-115	4-1	275-350	.....	9-1
"H" Monel	90-115	60-80	20-10	175-250	.....	45-35
<b>Structural Steel (ASTM. Spec. A7-36)</b>						
Plates, Shapes, Bars	60-70	33 Min.	22 Min.	.....	.....	.....
<b>Phosphor Bronze Spring Wire (SAE. Spec. 81)</b>						
.062", .125" Dia.	120 Min.	.....	.....	.....	.....	.....
<b>Brass Forgings (SAE Spec. 88)</b>						
Hot Pressed	45	18	25	.....	.....	.....

GENERAL

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## MECHANICAL PROPERTIES O NI-O-NEL alloy 825

The following properties of Ni-o-nel should not be used for specification purposes, but indicate average properties obtained on several forms.

Description	Size	Yield Strength (PSI)	Tensile Strength (PSI)	Elongation	Hardness*
Cold Drawn Tubing—Annealed	3/8" O.D. x .048	43,000	94,000	43.0	65 30-T†
	1" IPS	54,000	99,000	47.0	88
	1" IPS	53,000	100,000	36.0	94
Cold Drawn Wire, Rod—As Drawn	3/32" Dia.	.....	158,000	.....	.....
	1/8" Dia.	.....	155,500	.....	.....
	5/16" Dia.	.....	153,500	.....	.....
Cold Rolled Sheets—Annealed	.062" x 36" x 96"	41,500	95,500	44.0	80
	.109" x 36" x 96"	37,000	94,000	49.0	77
Cold Rolled Strip—Annealed	.125" x 1 1/4"	43,500	101,500	46.0	83
Hot Rolled Sheets—Annealed	.187" x 26" x 50"	39,000	91,500	50.0	78

\*Rockwell B

†"Rockwell Superficial" Hardness

## CREEP AND RUPTURE PROPERTIES OF INCOLOY alloy 800 AND INCONEL alloy 600

High-Temperature Strength  
Properties of Incoloy and  
Inconel

The two most useful properties employed in the design of structures for high-temperature service are the creep and rupture strengths. The creep strength at a given temperature relates the initially applied stress to a specific rate of plastic deformation in the interval of second-stage creep behavior, during which it is assumed that this rate is approximately constant with time. The rupture strength relates the initial stress to the time required to produce failure.

Since grain size may influence these properties profoundly, it may be desirable to refer to other data published by the International Nickel Company on Inconel and Incoloy.

Continued on next page



# DATA

## CREEP AND STRESS-RUPTURE PROPERTIES OF INCOLOY alloy 800

Temp. of	Creep Strength		Stress-Rupture Strength	
	Stress, PSI., to produce a minimum creep rate of:		Stress, PSI., for rupture in:	
	0.01 per cent in 1,000 hr.	0.10 per cent in 1,000 hr.	100 hr.	1,000 hr.
1400	1150	1500	9000	4500
1600	250	500	3700	2300
1800	250	500	2800	1700
2000	.....	200	1300	850

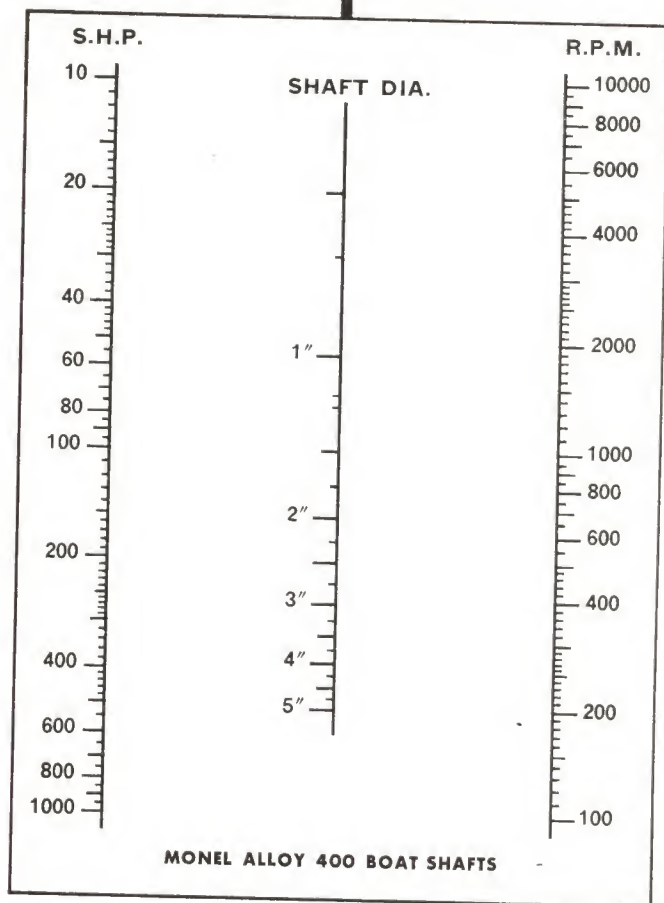
## CREEP AND STRESS-RUPTURE PROPERTIES OF INCONEL alloy 600

Temp. of	Creep Strength		Stress-Rupture Strength	
	Stress, PSI., to produce an elongation of:		Stress, PSI., for rupture in:	
	0.1 per cent in 10,000 hr.	1.0 per cent in 10,000 hr.	100 hr.	1,000 hr.
800	46,000	57,000	.....	.....
900	30,000	42,000	.....	.....
1000	14,500	25,000	50,000	34,000
1100	7,200	12,000	.....	.....
1200	5,500	9,300	21,000	12,000
1300	4,000 (4,000*)	6,400	.....	.....
1400	1,700	3,500	8,500	5,500
1500	680	1,400 (3,100*)	.....	.....
1600	460 (1,700*)	640 (2,000*)	4,500	2,700
1700	350	450 (1,100*)	.....	.....
1800	340 (340*)	560 (560*)	2,500 (2,800*)	1,560 (1,700*)
2000	.....	.... (270*)	.... (1,350*)	.... (880*)

\*Annealed at 2000° F. prior to testing.

# DATA

## MONEL alloy 400 BOAT SHAFT SIZES



A straight line drawn across the chart indicates the relations between the three factors, Shaft Horsepower, Revolutions per Minute and Diameter. For instance, for a 100-Horsepower engine turning at 1000 revolutions per minute the chart indicates a shaft size of 1 1/2" diameter.

This would be for an engine which has no reduction gears. If a heavier propeller were used in the same set of conditions with a gear reduction of 2 1/2 to 1, it would be necessary to go to approx-

*Continued on next page*

## MONEL alloy 400 BOAT SHAFT SIZES (Continued)

imately a  $2\frac{1}{8}$ " dia. shaft to accommodate the decreased r.p.m. (approximately 400).

In general the relation of engine speed to Shaft Speed is effected by the use of mechanical reduction gears with the subsequent increase of propeller size which the engine can drive with such relief. With this set of circumstances it becomes necessary to carry a heavier propeller. This is accomplished by cantilevering the propeller out beyond the stern bearing, and would normally call for a longer size tail shaft to accomodate the additional weight and torque for the increased load.

Because of a lower yield point and modulus of elasticity than Monel, naval bronze shafting should be increased by 20% above the determined value for Monel.

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## BURSTING PRESSURE OF SEAMLESS TUBING

This section is intended for use as a guide only. Although the data is taken from authoritative sources we cannot be responsible for the accuracy of the methods or tables. Complete information on bursting pressures is given in the ASME Boiler Code.

The information that follows refers specifically to seamless tubing which has received sufficient cold work during fabrication to produce a fine to medium grain structure. Welded tubing, brazed tubing, hot-rolled seamless tubing, and large-size, cold-drawn seamless tubing are not included in this discussion. Their properties depend upon methods of manufacture and may or may not conform to the following comments.

*Continued on next page*



## BURSTING PRESSURE OF SEAMLESS TUBING (Continued)

### INTERNAL PRESSURE

For all ordinary calculations pertaining to the bursting strength of commercial seamless tubes and pipes in straight lengths, regardless of material, Barlow's Formula (1) is the one most used. The inappreciable theoretical error resulting from its use is on the side of safety. This formula, as given below, was adopted by the ASME Boiler Construction Code (U-20) for determining internal pressure of non-ferrous tubes and pipes.

$$P = \frac{2St}{D} \text{ or } t = \frac{PD}{2S} \dots\dots\dots (1)$$

where: P = maximum allowable working pressure, in pounds per square inch.

t = minimum wall thickness, in inches.

$S = \frac{\text{Tensile Strength}}{\text{Factor of Safety}}$  = maximum allowable working stress from Tables A and B (pages 390 and 391) for ASME code requirements.

D = Outside diameter of pipe, in inches.

The usual factors of safety for non-code requirements are:

Power (steam).....	5
Liquids.....	4
Air and Gas.....	3

The formula is subject to the following instructions:

- (a) Applicable only to diameters  $\frac{1}{2}$  inch outside diameter to 6 inches outside diameter, inclusive, and for wall thicknesses not less than No. 18 Bwg. (0.049 inch).
- (b) Additional wall thickness should be provided where corrosion is expected.
- (c) Where tube ends are threaded, additional wall thickness of  $\frac{0.8}{\text{number of threads per inch}}$  is to be provided.
- (d) The requirements for rolling or otherwise setting tubes in tube plates, may require additional wall thickness.

The code provides the limiting stresses for use in the design of pressure vessels and it is necessary to take account of the effect of static head that may be produced in any part in order that such stress limits be not exceeded.

## BURSTING PRESSURE OF SEAMLESS TUBING

(Continued)

**TABLE A — MAXIMUM ALLOWABLE DESIGN STRESSES FOR NONFERROUS MATERIALS**  
(From Table U-3 of ASME Code for Unfired Pressure Vessels)

MATERIAL	ASME Spec.	Condition	Note	Spec. Min. Tensile	Psi. for Metal Temperatures Not Exceeding deg. F.										
					Subzero to 150	250	300	350	400	450	500	550	600	700	800
Monel Seamless Pipe or Tube	SB-163	Annealed	1	65,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000
Nickel Seamless Pipe or Tube	SB-165	Annealed	1	65,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000
Nickel Seamless Pipe or Tube	SB-161	Annealed	1	60,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
Nickel Seamless Pipe or Tube	SB-161	As-drawn	1	80,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000
Nickel Seamless Pipe or Tube	SB-163	Annealed	1	60,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
Nickel Seamless Pipe or Tube	SB-163	As-drawn	1	80,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000
Inconel Seamless Pipe or Tube	SB-167	Annealed	2	55,000	11,000	11,000	11,000	11,000	11,000	11,000	10,000	10,000	9,000	8,000	7,000
Copper-Nickel (70-30) Seamless Condenser Tubes	SB-111	Annealed	2	50,000	10,000	10,000	10,000	10,000	10,000	10,000	9,500	8,500	8,000	7,000	6,000
Copper-Nickel (80-20) Seamless Condenser Tubes	SB-111	Annealed	2	50,000	10,000	10,000	10,000	10,000	10,000	10,000	9,500	8,500	8,000	7,000	6,000
Wurtz Metal Seamless Pipe	SB-43	Annealed	2	50,000	10,000	10,000	10,000	10,000	10,000	10,000	9,500	8,500	8,000	7,000	6,000
Wurtz Metal Seamless Condenser Tubes	SB-111	Annealed	2	50,000	10,000	10,000	10,000	10,000	10,000	10,000	9,500	8,500	8,000	7,000	6,000
High Brass Seamless Pipe	SB-43	Annealed	2	45,000	9,000	9,000	9,000	9,000	9,000	9,000	8,500	7,500	7,000	6,000	5,000
Red Brass Seamless Pipe	SB-43	Annealed	2	40,000	8,000	8,000	8,000	8,000	8,000	8,000	7,500	6,500	6,000	5,000	4,000
Admiralty Seamless Condenser Tubes	SB-111	Annealed	2	40,000	8,000	8,000	8,000	8,000	8,000	8,000	7,500	6,500	6,000	5,000	4,000
Admiralty Seamless Pipe	SB-43	Annealed	2	45,000	9,000	9,000	9,000	9,000	9,000	9,000	8,500	7,500	7,000	6,000	5,000
Aluminum Brass Seamless Condenser Tubes	SB-111	Annealed	2	45,000	9,000	9,000	9,000	9,000	9,000	9,000	8,500	7,500	7,000	6,000	5,000
Aluminum Brass Seamless Condenser Tubes	SB-111	Annealed	2	45,000	9,000	9,000	9,000	9,000	9,000	9,000	8,500	7,500	7,000	6,000	5,000
Aluminum Bronze Seamless Condenser Tubes	SB-111	Annealed	2	50,000	10,000	10,000	10,000	10,000	10,000	10,000	9,500	8,500	8,000	7,000	6,000
Copper Seamless Boiler Tubes	SB-13	Annealed	2	30,000	6,000	6,000	6,000	6,000	6,000	6,000	5,500	4,500	4,000	3,000	2,000
Copper Seamless Tube and Pipe	SB-42	Annealed	2	30,000	6,000	6,000	6,000	6,000	6,000	6,000	5,500	4,500	4,000	3,000	2,000
Copper Seamless Tube and Pipe	SB-42	Light-drawn	2	36,000	7,200	7,200	7,200	7,200	7,200	7,200	6,700	5,700	5,200	4,200	3,200
Copper Seamless Tube and Pipe	SB-42	Hard-drawn	2	30,000	10,000	10,000	10,000	10,000	10,000	10,000	9,500	8,500	8,000	7,000	6,000
Copper Seamless Tubes	SB-75	Annealed	2	30,000	6,000	6,000	6,000	6,000	6,000	6,000	5,500	4,500	4,000	3,000	2,000
Copper Seamless Tubes	SB-75	Light-drawn	2	36,000	7,200	7,200	7,200	7,200	7,200	7,200	6,700	5,700	5,200	4,200	3,200
Copper Seamless Tubes	SB-75	Hard-drawn	2	30,000	10,000	10,000	10,000	10,000	10,000	10,000	9,500	8,500	8,000	7,000	6,000
Copper Seamless Condenser Tubes	SB-111	Light-drawn	2	36,000	7,200	7,200	7,200	7,200	7,200	7,200	6,700	5,700	5,200	4,200	3,200
Copper Seamless Condenser Tubes	SB-111	Light-drawn	2	36,000	7,200	7,200	7,200	7,200	7,200	7,200	6,700	5,700	5,200	4,200	3,200

1—As-drawn, stress-equalized "condenser tubes."  
2—"Minimum tensile strength" not given in specification.



# BURSTING PRESSURE OF SEAMLESS TUBING (Continued)

**TABLE B — MAXIMUM ALLOWABLE WORKING STRESSES FOR FERROUS MATERIALS**  
(From Table U-2 of ASME Code for Unfired Pressure Vessels)

MATERIAL	ASME Spec.	Note	Spec. Min. Tensile	Psi for Metal Temperatures Not Exceeding deg. F.										
				-20 to 650	700	750	800	850	900	950	1000	1050	1100	1150 1200
Seamless Alloy Steel Pipe and Tubes														
Chromium-molybdenum	SA-158—P3a		60,000	12,000	12,000	12,000	11,800	11,200	10,000	8,000	5,850	3,850	2,200	1,400
Chromium-molybdenum	SA-158—P3b		60,000	12,000	12,000	12,000	11,800	11,200	10,000	8,000	5,850	3,850	2,200	1,400
4-6 per cent Chromium	SA-158—P5a	1	60,000	12,000	12,000	12,000	11,800	11,200	10,000	8,000	5,850	3,850	2,200	1,400
4-6 per cent Chromium-silicon molybdenum														
4-6 per cent Chromium-molybdenum stabilized	SA-158—P5c		60,000	11,000	11,000	11,000	11,000	10,850	10,000	8,000	5,850	3,850	2,200	1,400
18 Chromium-8 Nickel	SA-158—P8a		75,000	15,000	15,000	14,600	14,300	14,000	13,400	12,300	10,000	8,000	6,000	3,600
18 Chromium-10 Nickel stabilized	SA-158—P8b	2	75,000	15,000	15,000	14,600	14,300	14,000	13,400	12,300	10,000	8,000	6,000	3,600
Chromium-molybdenum	SA-158—P11		60,000	12,000	12,000	12,000	11,800	11,200	10,000	8,000	5,850	3,850	2,200	1,400
Chromium-molybdenum	SA-213—T3		60,000	12,000	12,000	12,000	11,800	11,200	10,000	8,000	5,850	3,850	2,200	1,400
Chromium-molybdenum	SA-213—T5		60,000	12,000	12,000	12,000	11,800	11,200	10,000	8,000	5,850	3,850	2,200	1,400
Chromium-nickel	SA-213—T8	2	75,000	15,000	15,000	14,600	14,300	14,000	13,400	12,300	10,000	8,000	6,000	3,600
Chromium-silicon-molybdenum	SA-213—T11		60,000	12,000	12,000	12,000	11,800	11,200	10,000	8,000	5,850	3,850	2,200	1,400
Chromium-molybdenum	SA-213—T12		60,000	12,000	12,000	12,000	11,800	11,200	10,000	8,000	5,850	3,850	2,200	1,400
Chromium-silicon-molybdenum	SA-213—T13		60,000	12,000	12,000	12,000	11,800	11,200	10,000	8,000	5,850	3,850	2,200	1,400
Chromium-molybdenum-titanium	SA-213—T14		60,000	12,000	12,000	12,000	11,800	11,200	10,000	8,000	5,850	3,850	2,200	1,400
Chromium-molybdenum-titanium	SA-213—T16		60,000	11,000	11,000	11,000	11,000	10,850	10,000	8,000	5,850	3,850	2,200	1,400
Chromium-nickel-titanium	SA-213—T18		75,000	15,000	15,000	14,600	14,300	14,000	13,400	12,300	10,000	8,000	6,000	3,600
Chromium-nickel-columbium	SA-213—T19		75,000	15,000	15,000	14,600	14,300	14,000	13,400	12,300	10,000	8,000	6,000	3,600
Chromium-nickel	SA-213—T20	2	75,000	15,000	15,000	14,600	14,300	14,000	13,400	12,300	10,000	8,000	6,000	3,600
Electric-Resistance-Welded Alloy Steel														
Chromium-nickel	SA-249—T8	3	75,000	15,000	15,000	14,600	14,300	14,000	13,400	12,300	10,000	8,000	6,000	3,600
Chromium-nickel-titanium	SA-249—T18	3	75,000	15,000	15,000	14,600	14,300	14,000	13,400	12,300	10,000	8,000	6,000	3,600
Chromium-nickel-columbium	SA-249—T19	3	75,000	15,000	15,000	14,600	14,300	14,000	13,400	12,300	10,000	8,000	6,000	3,600
Chromium-nickel-molybdenum	SA-249—T20	3	75,000	15,000	15,000	14,600	14,300	14,000	13,400	12,300	10,000	8,000	6,000	3,600
Chromium-nickel-molybdenum	SA-249—T24	3	75,000	15,000	15,000	14,600	14,300	14,000	13,400	12,300	10,000	8,000	6,000	3,600

1—These stresses permitted only with molybdenum.

2—No allowance has been made for corrosive action in the allowable stresses given. Carbide precipitation in service is also to be expected at temperatures above 750° F.

3—These are base stresses for the material; they must be modified for the particular type of longitudinal joint in accordance with Table U-4 of ASME Code for Unfired Pressure Vessels.



## HARDNESS CONVERSION TABLE (APPROXIMATE)

Values vary depending on grades and conditions of material involved. Rockwell "B" Scale should not be used over B-100. The "C" Scale should not be used under C-20.

Brinell Hard No.	Rockwell		Shore Sclero- scope Hard No.	Tensile Lbs. Sq. In. In 1000 Lbs.	Brinell Hard No.	Rock- well B Scale	Shore Sclero- scope Hard No.	Tensile Lbs. Sq. In. In 1000 Lbs.
	B Scale	C Scale						
782	72		107	383	163	84	25	84
744	69		100	365	159	83	25	82
713	67		96	350	156	82	24	80
683	65		92	334	153	81	24	79
652	63		88	318	149	80	23	78
627	61		85	307	146	78	23	77
600	59		81	294	143	77	22	76
578	58		78	284	140	76	..	74
555	56		75	271	137	75	..	73
532	54		72	260	134	74	..	71
512	52		70	251	131	72	..	70
495	51		68	242	128	71	..	69
477	49		66	233	126	70	..	67
460	48		64	226	124	69	..	66
444	47		61	217	121	67	..	65
430	45		59	210	118	66	..	63
418	44		57	205	116	65	..	62
402	43		55	197	114	64	..	61
387	41		53	189	112	62	..	60
375	40		52	183	109	61	..	59
364	39		50	178	107	59	..	58
351	38		49	172	105	58	..	57
340	37		47	167	103	57	..	56
332	36		46	162	101	56	..	55
321	35		45	157	99	54	..	54
311	34		44	152	97	53	..	53
302	33		42	148	96	52	..	53
293	31		41	144	95	51	..	52
286	30		40	140	93	50	..	52
277	29		39	136	92	49	..	51
269	28		38	132	90	48	..	50
262	27		37	128	88	47	..	49
255	26		36	125	87	46	..	48
248	25		36	121	86	45	..	48
241	100	24	35	118	85	44	..	47
235	99	23	34	115	83	43	..	47
228	98	22	33	113	82	42	..	46
223	97	21	33	109	81	41	..	46
217	96	20	32	106	80	40	..	45
212	95	..	31	104	79	39	..	45
207	94	..	30	101	78	38	..	44
202	93	..	30	99	77	37	..	44
196	92	..	29	96	76	36	..	43
192	91	..	29	94	75	35	..	43
187	90	..	28	91	74	33	..	42
183	89	..	28	90	73	31	..	42
179	88	..	27	89	72	30	..	41
174	87	..	27	88	71	29	..	41
170	86	..	26	86	70	27	..	40
166	85	..	26	85	69	26	..	40

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DIMENSIONS FOR SEAMLESS AND WELDED PIPE COMMONLY USED FOR CORROSION SERVICE

Nom. Pipe Size	Schedule 5S		Schedule 10S		Schedule 20		Schedule 30		Schedule 40S and Standard Wt. (B)		Schedule 40 (B)		Schedule 60	
	Wall Thick.	Inside Diam.	Wall Thick.	Inside Diam.	Wall Thick.	Inside Diam.	Wall Thick.	Inside Diam.	Wall Thick.	Inside Diam.	Wall Thick.	Inside Diam.	Wall Thick.	Inside Diam.
1/8	.....	.....	.049	.307	.....	.....	.....	.....	.068	.289	.068	.269	.....	.....
1/4	.....	.....	.065	.410	.....	.....	.....	.....	.088	.364	.088	.364	.....	.....
3/8	.....	.....	.083	.545	.....	.....	.....	.....	.109	.493	.109	.493	.....	.....
1/2	.....	.710	.083	.674	.....	.....	.....	.....	.125	.622	.125	.622	.....	.....
5/8	.065	.920	.083	.884	.....	.....	.....	.....	.145	.824	.145	.824	.....	.....
1	.065	1.185	.083	1.097	.....	.....	.....	.....	.165	1.049	.165	1.049	.....	.....
1 1/8	.065	1.530	.109	1.442	.....	.....	.....	.....	.185	1.380	.185	1.380	.....	.....
1 1/2	.065	1.770	.109	1.682	.....	.....	.....	.....	.203	1.610	.203	1.610	.....	.....
2	.065	2.245	.109	2.157	.....	.....	.....	.....	.223	2.067	.223	2.067	.....	.....
2 1/2	.083	2.709	.120	2.635	.....	.....	.....	.....	.243	2.469	.243	2.469	.....	.....
3	.083	3.334	.120	3.260	.....	.....	.....	.....	.263	3.068	.263	3.068	.....	.....
3 1/2	.083	3.834	.120	3.760	.....	.....	.....	.....	.283	3.548	.283	3.548	.....	.....
4	.109	4.345	.134	4.260	.....	.....	.....	.....	.303	4.026	.303	4.026	.....	.....
5	.109	5.563	.134	5.295	.....	.....	.....	.....	.323	5.047	.323	5.047	.....	.....
6	.109	6.625	.148	6.337	.....	.....	.....	.....	.343	5.947	.343	5.947	.....	.....
8	.109	8.625	.148	8.329	.....	.....	.....	.....	.363	7.981	.363	7.981	.....	.....
10	.134	10.750	.165	10.420	.250	8.125	.277	8.071	.383	10.070	.383	10.070	.406	7.813
12	.156	12.750	.180	12.380	.250	10.250	.307	10.136	.403	12.000	.403	12.000	.426	9.750
14	.156(A)	14.000	.188(A)	13.624	.250	12.250	.330	12.090	.423	13.250	.423	13.250	.446	11.626
16	.165(A)	16.000	.188(A)	15.624	.250	13.376	.375	13.250	.443	15.250	.443	15.250	.466	13.626
18	.165(A)	18.000	.188(A)	17.624	.250	15.376	.438	15.250	.463	17.250	.463	17.250	.486	15.626
20	.188(A)	20.000	.188(A)	19.624	.250	17.376	.500	19.000	.483	19.250	.483	19.250	.506	17.626
24	.218(A)	24.000	.250(A)	23.500	.375	23.250	.562	22.876	.503	23.250	.503	23.250	.526	21.626

All dimensions are in inches.

Dimensions for Standard Weight, Extra Strong, Double Extra Strong, Schedules 10, 20, 30, 40, 60, 80, 100, 120, 140 and 160 are in conformance with A.S.A. B36.10.

Dimensions for Schedules 5S, 10S, 40S, and 80S are in conformance with A.S.A. B36.19.

(A) Proposed wall thickness for Schedules 5S and 10S.

(B) Wall thicknesses for Schedules 40, 40S, and Standard Weight are identical through 10" size.

(C) Wall thicknesses for Schedules 80, 80S, and Extra Strong are identical through 8" size.

(1) Thickness agrees with that for Standard Weight Pipe (A.S.A. B36.10); not included in Schedule 40S.

(2) Thickness agrees with that for Extra Strong Pipe (A.S.A. B36.10); not included in Schedule 80S.

## DIMENSIONS FOR SEAMLESS AND WELDED PIPE

DIMENSIONS FOR SEAMLESS AND WELDED PIPE COMMONLY USED FOR CORROSION SERVICE—Continued

Nom. Pipe Size	Outside Diam.	Schedule 80S and Extra Strong (C)	Schedule 80 (C)	Schedule 100	Schedule 120	Schedule 140	Schedule 160	Double X Strong
		Wall Thick.	Inside Diam.	Wall Thick.	Inside Diam.	Wall Thick.	Inside Diam.	Wall Thick.
1/8	.405	.085	.215	.095				
1/4	.496	.107	.302	.119				
3/8	.576	.128	.382	.140				
1/2	.675	.146	.466	.157				
3/4	.764	.167	.546	.177				
1	.864	.187	.625	.197				
1 1/8	1.050	.215	.742	.225				
1 1/4	1.131	.228	.825	.238				
1 1/2	1.278	.250	.928	.260				
1 3/4	1.406	.275	1.050	.285				
2	1.600	.312	1.278	.322				
2 1/2	1.875	.354	1.562	.364				
3	2.125	.406	1.812	.412				
3 1/2	2.375	.450	2.062	.456				
4	2.625	.500	2.312	.506				
5	3.000	.562	2.750	.568				
6	3.500	.625	3.250	.632				
8	4.500	.750	4.000	.762				
10	5.000	.875	4.625	.882				
12	5.750	.100	5.375	.100				
14	6.125	.100	5.750	.100				
16	6.625	.100	6.250	.100				
18	7.125	.100	6.750	.100				
20	7.625	.100	7.250	.100				
24	9.000	.100	8.625	.100				
28	10.500	.100	10.125	.100				
36	13.000	.100	12.625	.100				
42	15.000	.100	14.625	.100				
48	17.000	.100	16.625	.100				
54	19.000	.100	18.625	.100				
60	21.000	.100	20.625	.100				
66	23.000	.100	22.625	.100				
72	25.000	.100	24.625	.100				
78	27.000	.100	26.625	.100				
84	29.000	.100	28.625	.100				
90	31.000	.100	30.625	.100				
96	33.000	.100	32.625	.100				
102	35.000	.100	34.625	.100				
108	37.000	.100	36.625	.100				
114	39.000	.100	38.625	.100				
120	41.000	.100	40.625	.100				
126	43.000	.100	42.625	.100				
132	45.000	.100	44.625	.100				
138	47.000	.100	46.625	.100				
144	49.000	.100	48.625	.100				
150	51.000	.100	50.625	.100				
156	53.000	.100	52.625	.100				
162	55.000	.100	54.625	.100				
168	57.000	.100	56.625	.100				
174	59.000	.100	58.625	.100				
180	61.000	.100	60.625	.100				
186	63.000	.100	62.625	.100				
192	65.000	.100	64.625	.100				
198	67.000	.100	66.625	.100				
204	69.000	.100	68.625	.100				
210	71.000	.100	70.625	.100				
216	73.000	.100	72.625	.100				
222	75.000	.100	74.625	.100				
228	77.000	.100	76.625	.100				
234	79.000	.100	78.625	.100				
240	81.000	.100	80.625	.100				
246	83.000	.100	82.625	.100				
252	85.000	.100	84.625	.100				
258	87.000	.100	86.625	.100				
264	89.000	.100	88.625	.100				
270	91.000	.100	90.625	.100				
276	93.000	.100	92.625	.100				
282	95.000	.100	94.625	.100				
288	97.000	.100	96.625	.100				
294	99.000	.100	98.625	.100				
300	101.000	.100	100.625	.100				
306	103.000	.100	102.625	.100				
312	105.000	.100	104.625	.100				
318	107.000	.100	106.625	.100				
324	109.000	.100	108.625	.100				
330	111.000	.100	110.625	.100				
336	113.000	.100	112.625	.100				
342	115.000	.100	114.625	.100				
348	117.000	.100	116.625	.100				
354	119.000	.100	118.625	.100				
360	121.000	.100	120.625	.100				
366	123.000	.100	122.625	.100				
372	125.000	.100	124.625	.100				
378	127.000	.100	126.625	.100				
384	129.000	.100	128.625	.100				
390	131.000	.100	130.625	.100				
396	133.000	.100	132.625	.100				
402	135.000	.100	134.625	.100				
408	137.000	.100	136.625	.100				
414	139.000	.100	138.625	.100				
420	141.000	.100	140.625	.100				
426	143.000	.100	142.625	.100				
432	145.000	.100	144.625	.100				
438	147.000	.100	146.625	.100				
444	149.000	.100	148.625	.100				
450	151.000	.100	150.625	.100				
456	153.000	.100	152.625	.100				
462	155.000	.100	154.625	.100				
468	157.000	.100	156.625	.100				
474	159.000	.100	158.625	.100				
480	161.000	.100	160.625	.100				
486	163.000	.100	162.625	.100				
492	165.000	.100	164.625	.100				
498	167.000	.100	166.625	.100				
504	169.000	.100	168.625	.100				
510	171.000	.100	170.625	.100				
516	173.000	.100	172.625	.100				
522	175.000	.100	174.625	.100				
528	177.000	.100	176.625	.100				
534	179.000	.100	178.625	.100				
540	181.000	.100	180.625	.100				
546	183.000	.100	182.625	.100				
552	185.000	.100	184.625	.100				
558	187.000	.100	186.625	.100				
564	189.000	.100	188.625	.100				
570	191.000	.100	190.625	.100				
576	193.000	.100	192.625	.100				
582	195.000	.100	194.625	.100				
588	197.000	.100	196.625	.100				
594	199.000	.100	198.625	.100				
600	201.000	.100	200.625	.100				
606	203.000	.100	202.625	.100				
612	205.000	.100	204.625	.100				
618	207.000	.100	206.625	.100				
624	209.000	.100	208.625	.100				
630	211.000	.100	210.625	.100				
636	213.000	.100	212.625	.100				
642	215.000	.100	214.625	.100				
648	217.000	.100	216.625	.100				
654	219.000	.100	218.625	.100				
660	221.000	.100	220.625	.100				
666	223.000	.100	222.625	.100				
672	225.000	.100	224.625	.100				
678	227.000	.100	226.625	.100				
684	229.000	.100	228.625	.100				
690	231.000	.100	230.625	.100				
696	233.000	.100	232.625	.100				
702	235.000	.100	234.625	.100				
708	237.000	.100	236.625	.100				
714	239.000	.100	238.625	.100				
720	241.000	.100	240.625	.100				
726	243.000	.100	242.625	.100				
732	245.000	.100	244.625	.100				
738	247.000	.100	246.625	.100				
744	249.000	.100	248.625	.100				
750	251.000	.100	250.625	.100				
756	253.000	.100	252.625	.100				
762	255.000	.100	254.625	.100				
768	257.000	.100	256.625	.100				
774	259.000	.100	258.625	.100				
780	261.000	.100	260.625	.100				
786	263.000	.100	262.625	.100				
792	265.000	.100	264.625	.100				
798	267.000	.100	266.625	.100				
804	269.000	.100	268.625	.100				
810	271.000	.100	270.625	.100				
816	273.000	.100	272.625	.100				
822	275.000	.100	274.625	.100				
828	277.000	.100	276.625	.100				
834	279.000	.100	278.625	.100				
840	281.000	.100	280.625	.100				
846	283.000	.100	282.625	.100				
852	285.000	.100	284.625	.100				
858	287.000	.100	286.625	.100				
864	289.000	.100	288.625	.100				
870	291.000	.100	290.625	.100				
876	293.000	.100	292.625	.100				
882	295.000	.100	294.625	.100				
888	297.000	.100	296.625	.100				
894	299.000	.100	298.625	.100				
900	301.000	.100	300.625	.100				
906	303.000	.100	302.625	.100				
912	305.000	.100	304.625	.100				
918	307.000	.100	306.625	.100				
924	309.000	.100	308.625	.100				
930	311.000	.100	310.					



# DATA

## CIRCUMFERENCE AND AREA OF CIRCLES

Diameter In Inches	Circumference		Area Square Feet	Diameter In Inches	Circumference		Area Square Feet
	Feet	Inches			Feet	Inches	
1/16	..	13/64	....	4 1/2	1	2 1/8	.1104
1/8	..	25/64	....	4 5/8	1	2 1/2	.1167
3/16	..	19/32	....	4 3/4	1	2 7/8	.1230
1/4	..	25/32	....	4 7/8	1	3 5/16	.1237
5/16	..	63/64	....	5	1	3 11/16	.1364
3/8	..	1 11/64	....	5 1/8	1	4 1/16	.1433
7/16	..	1 3/8	....	5 1/4	1	4 7/16	.1503
1/2	..	1 37/64	....	5 3/8	1	4 7/8	.1575
9/16	..	1 49/64	....	5 1/2	1	5 1/4	.1650
5/8	..	1 15/16	....	5 5/8	1	5 5/8	.1726
11/16	..	2 5/32	....	5 3/4	1	6	.1803
3/4	..	2 23/64	....	5 7/8	1	6 7/16	.1883
13/16	..	2 35/64	....	6	1	6 13/16	.1964
7/8	..	2 3/4	....	6 1/8	1	7 3/16	.2046
15/16	..	2 15/16	....	6 1/4	1	7 5/8	.2131
1	..	3 9/64	.0055	6 3/8	1	8	.2217
1 1/8	..	3 1/2	.0069	6 1/2	1	8 3/8	.2304
1 1/4	..	3 7/8	.0085	6 5/8	1	8 3/4	.2394
1 3/8	..	4 5/16	.0103	6 3/4	1	9 3/16	.2485
1 1/2	..	4 11/16	.0123	6 7/8	1	9 9/16	.2578
1 5/8	..	5 1/16	.0144	7	1	9 15/16	.2673
1 3/4	..	5 7/16	.0167	7 1/8	1	10 3/8	.2763
1 7/8	..	5 7/8	.0192	7 1/4	1	10 3/4	.2867
2	..	6 1/4	.0218	7 3/8	1	11 1/8	.2966
2 1/8	..	6 5/8	.0246	7 1/2	1	11 1/2	.3068
2 1/4	..	7	.0276	7 5/8	1	11 15/16	.3164
2 3/8	..	7 7/16	.0308	7 3/4	2	5/16	.3275
2 1/2	..	7 13/16	.0341	7 7/8	2	11/16	.3382
2 5/8	..	8 3/16	.0376	8	2	1 1/8	.3491
2 3/4	..	8 5/8	.0412	8 1/8	2	1 1/2	.3601
2 7/8	..	9	.0451	8 1/4	2	1 7/8	.3712
3	..	9 3/8	.0491	8 3/8	2	2 1/4	.3826
3 1/8	..	9 13/16	.0533	8 1/2	2	2 11/16	.3941
3 1/4	..	10 3/16	.0576	8 5/8	2	3 1/16	.4057
3 3/8	..	10 9/16	.0621	8 3/4	2	3 7/16	.4176
3 1/2	..	10 15/16	.0668	8 7/8	2	3 3/8	.4296
3 5/8	..	11 3/8	.0717	9	2	4 1/4	.4418
3 3/4	..	11 3/4	.0767	9 1/8	2	4 5/8	.4541
3 7/8	1	1 1/8	.0819	9 1/4	2	5	.4667
4	1	9/16	.0873	9 3/8	2	5 7/16	.4794
4 1/8	1	1 5/16	.0928	9 1/2	2	5 13/16	.4922
4 1/4	1	1 5/16	.0985	9 5/8	2	6 3/16	.5053
4 3/8	1	1 11/16	.1044	9 3/4	2	6 5/8	.5185

To find the weight of a circle, multiply its area in square feet by the weight per square foot, as shown on pages 249 to 252. For example, if you want the weight of an 1/8" thick brass circle, 23" in diameter...

Multiply 5.508 pounds (weight per sq. ft. of 1/8" brass)  
by 2.885 (area in square feet)  
= 15.891 + pounds

Continued on next page

## CIRCUMFERENCE AND AREA OF CIRCLES (Continued)

Diameter In Inches	Circumference		Area Square Feet	Diameter In Inches	Circumference		Area Square Feet
	Feet	Inches			Feet	Inches	
9 7/8	2	7	.5319	16	4	2 1/4	1.396
10	2	7 3/8	.5454	16 1/8	4	2 5/8	1.418
10 1/8	2	7 3/4	.5591	16 1/4	4	3	1.440
10 1/4	2	8 3/16	.5730	16 3/8	4	3 7/16	1.463
10 3/8	2	8 9/16	.5871	16 1/2	4	3 13/16	1.485
10 1/2	2	8 15/16	.6013	16 5/8	4	4 1/4	1.508
10 5/8	2	9 3/8	.6157	16 3/4	4	4 5/8	1.530
10 3/4	2	9 3/4	.6303	16 7/8	4	5	1.553
10 7/8	2	10 1/8	.6450	17	4	5 3/8	1.576
11	2	10 1/2	.6600	17 1/8	4	5 3/4	1.599
11 1/8	2	10 15/16	.6750	17 1/4	4	6 3/16	1.623
11 1/4	2	11 5/16	.6902	17 3/8	4	6 9/16	1.647
11 1/2	2	11 11/16	.7057	17 1/2	4	6 15/16	1.670
11 3/8	3	1/8	.7213	17 5/8	4	7 5/16	1.694
11 5/8	3	1/2	.7371	17 3/4	4	7 3/4	1.712
11 3/4	3	7/8	.7530	17 7/8	4	8 1/8	1.743
11 7/8	3	1 1/4	.7690	18	4	8 1/2	1.767
12	3	1 11/16	.7854	18 1/8	4	8 15/16	1.792
12 1/8	3	2 1/16	.8019	18 1/4	4	9 5/16	1.817
12 1/4	3	2 7/16	.8185	18 3/8	4	9 3/4	1.842
12 3/8	3	2 7/8	.8353	18 1/2	4	10 1/16	1.866
12 1/2	3	3 1/4	.8523	18 5/8	4	10 1/2	1.892
12 5/8	3	3 5/8	.8694	18 3/4	4	10 7/8	1.918
12 3/4	3	4	.8867	18 7/8	4	11 1/4	1.943
12 7/8	3	4 7/16	.9041	19	4	11 1/2	1.968
13	3	4 13/16	.9218	19 1/8	5	1 1/16	1.995
13 1/8	3	5 3/16	.9396	19 1/4	5	7/16	2.021
13 1/4	3	5 5/8	.9576	19 3/8	5	13/16	2.047
13 3/8	3	6	.9757	19 1/2	5	1 1/4	2.074
13 1/2	3	6 3/8	.9940	19 5/8	5	1 5/8	2.100
13 5/8	3	6 3/4	1.013	19 3/4	5	2	2.127
13 3/4	3	7 3/16	1.031	19 7/8	5	2 7/16	2.154
13 7/8	3	7 9/16	1.050	20	5	2 13/16	2.181
14	3	7 15/16	1.069	20 1/8	5	3 3/16	2.209
14 1/8	3	8 3/8	1.088	20 1/4	5	3 9/16	2.237
14 1/4	3	8 3/4	1.108	20 3/8	5	4	2.264
14 3/8	3	9 1/8	1.127	20 1/2	5	4 3/8	2.292
14 1/2	3	9 1/2	1.147	20 5/8	5	4 3/4	2.320
14 5/8	3	9 15/16	1.167	20 3/4	5	5 3/16	2.348
14 3/4	3	10 5/16	1.187	20 7/8	5	5 9/16	2.377
14 7/8	3	10 11/16	1.207	21	5	5 15/16	2.405
15	3	11 1/16	1.227	21 1/8	5	6 5/16	2.434
15 1/8	3	11 1/2	1.248	21 1/4	5	6 3/4	2.463
15 1/4	3	11 7/8	1.268	21 3/8	5	7 1/8	2.492
15 3/8	4	1/4	1.289	21 1/2	5	7 1/2	2.521
15 1/2	4	5/8	1.310	21 5/8	5	7 7/8	2.551
15 5/8	4	1 1/16	1.332	21 3/4	5	8 5/16	2.580
15 3/4	4	1 7/8	1.353	21 7/8	5	8 11/16	2.607
15 7/8	4	1 15/16	1.375	22	5	9 1/16	2.639

Continued on next page

# CIRCUMFERENCE AND AREA OF CIRCLES (Continued)

Diameter In Inches	Circumference		Area Square Feet	Diameter In Inches	Circumference		Area Square Feet
	Feet	Inches			Feet	Inches	
22 1/4	5	9 1/2	2.670	32 1/2	8	6 1/16	5.760
22 1/4	5	9 7/8	2.700	32 3/4	8	6 7/8	5.849
22 3/8	5	10 1/4	2.730	33	8	7 5/8	5.939
22 1/2	5	10 5/8	2.761	33 1/4	8	8 7/16	6.029
22 5/8	5	11 1/16	2.792	33 1/2	8	9 3/16	6.121
22 3/4	5	11 7/16	2.823	33 3/4	8	10	6.212
22 7/8	5	11 3/8	2.854	34	8	10 13/16	6.305
23	6	1 1/4	2.885	34 1/4	8	11 9/16	6.398
23 1/8	6	5/8	2.917	34 1/2	9	3/8	6.490
23 1/4	5	1	2.948	34 3/4	9	1 1/8	6.581
23 3/8	6	1 3/8	2.980	35	9	1 5/16	6.681
23 1/2	6	1 13/16	3.012	35 1/4	9	2 11/16	6.771
23 5/8	6	2 3/16	3.044	35 1/2	9	3 1/2	6.873
23 3/4	6	2 9/16	3.076	35 3/4	9	4 1/4	6.970
23 7/8	6	3	3.109	36	9	5 1/16	7.068
24	6	3 3/8	3.141	36 1/4	9	5 7/8	7.167
24 1/4	6	4 1/8	3.207	36 1/2	9	6 5/8	7.266
24 1/2	6	4 15/16	3.274	36 3/4	9	7 7/16	7.361
24 3/4	6	5 3/4	3.341	37	9	8 3/16	7.466
25	6	6 1/2	3.408	37 1/4	9	9	7.568
25 1/4	6	7 5/16	3.477	37 1/2	9	9 3/4	7.670
25 1/2	6	8 1/16	3.546	37 3/4	9	10 9/16	7.770
25 3/4	6	8 7/8	3.616	38	9	11 3/8	7.875
26	6	9 5/8	3.687	38 1/4	10	1/8	7.979
26 1/4	6	10 7/16	3.758	38 1/2	10	1 5/16	8.081
26 1/2	6	11 1/4	3.830	38 3/4	10	1 11/16	8.189
26 3/4	7	...	3.900	39	10	2 1/2	8.295
27	7	13/16	3.976	39 1/4	10	3 1/4	8.403
27 1/4	7	1 9/16	4.050	39 1/2	10	4 1/16	8.509
27 1/2	7	2 3/8	4.125	39 3/4	10	4 7/8	8.618
27 3/4	7	3 1/8	4.200	40	10	5 5/8	8.726
28	7	3 15/16	4.276	40 1/4	10	6 7/16	8.831
28 1/4	7	4 11/16	4.353	40 1/2	10	7 3/16	8.941
28 1/2	7	5 1/2	4.430	40 3/4	10	8	9.051
28 3/4	7	6 1/4	4.508	41	10	8 3/4	9.168
29	7	7 1/16	4.586	41 1/4	10	9 9/16	9.280
29 1/4	7	7 7/8	4.666	41 1/2	10	10 3/8	9.391
29 1/2	7	8 5/8	4.746	41 3/4	10	11 1/8	9.501
29 3/4	7	9 7/16	4.827	42	10	11 15/16	9.621
30	7	10 3/16	4.908	42 1/4	11	1 1/16	9.736
30 1/4	7	11	4.990	42 1/2	11	1 1/2	9.851
30 1/2	7	11 13/16	5.073	42 3/4	11	2 1/4	9.968
30 3/4	8	9/16	5.157	43	11	3 1/16	10.084
31	8	1 3/8	5.241	43 1/4	11	3 13/16	10.202
31 1/4	8	2 1/8	5.326	43 1/2	11	4 5/8	10.320
31 1/2	8	2 15/16	5.412	43 3/4	11	5 3/8	10.439
31 3/4	8	3 11/16	5.498	44	11	6 3/16	10.559
32	8	4 1/2	5.585	44 1/4	11	7	10.679
32 1/4	8	5 5/16	5.672	44 1/2	11	7 3/4	10.800

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## CIRCUMFERENCE AND AREA OF CIRCLES (Continued)

Diameter In Inches	Circumference		Area Square Feet	Diameter In Inches	Circumference		Area Square Feet
	Feet	Inches			Feet	Inches	
44 3/4	11	8 9/16	10.922	57	14	11 1/16	17.721
45	11	9 3/8	11.044	57 1/4	14	11 13/16	17.876
45 1/4	11	10 1/8	11.161	57 1/2	15	5 5/8	18.032
45 1/2	11	10 15/16	11.290	57 3/4	15	1 3/8	18.190
45 3/4	11	11 11/16	11.415	58	15	2 3/16	18.348
46	12	1 1/2	11.540	58 1/4	15	2 15/16	18.506
46 1/4	12	1 1/4	11.666	58 1/2	15	3 3/4	18.665
46 1/2	12	2 1/16	11.793	58 3/4	15	4 9/16	18.825
46 3/4	12	2 13/16	11.920	59	15	5 5/16	18.986
47	12	3 5/8	12.048	59 1/4	15	6 1/8	19.147
47 1/4	12	4 7/16	12.177	59 1/2	15	6 7/8	19.309
47 1/2	12	5 3/16	12.306	59 3/4	15	7 11/16	19.471
47 3/4	12	6	12.436	60	15	8 1/2	19.635
48	12	6 3/4	12.566	60 1/4	15	9 1/4	19.799
48 1/4	12	7 9/16	12.697	60 1/2	15	10 1/16	19.964
48 1/2	12	8 5/16	12.829	60 3/4	15	10 13/16	20.129
48 3/4	12	9 1/8	12.961	61	15	11 5/8	20.295
49	12	9 15/16	13.095	61 1/4	16	3 3/8	20.462
49 1/4	12	10 11/16	13.229	61 1/2	16	1 3/16	20.623
49 1/2	12	11 1/2	13.363	61 3/4	16	1 15/16	20.797
49 3/4	13	1/4	13.499	62	16	2 3/4	20.966
50	13	1 1/16	13.635	62 1/4	16	3 9/16	21.135
50 1/4	13	1 13/16	13.772	62 1/2	16	4 5/16	21.306
50 1/2	13	2 5/8	13.909	62 3/4	16	5 1/8	21.476
50 3/4	13	3 3/8	14.047	63	16	5 7/8	21.648
51	13	4 3/16	14.186	63 1/4	16	6 11/16	21.819
51 1/4	13	5	14.325	63 1/2	16	7 7/16	21.992
51 1/2	13	5 3/4	14.465	63 3/4	16	8 1/4	22.166
51 3/4	13	6 9/16	14.606	64	16	9	22.340
52	13	7 5/16	14.748	64 1/4	16	9 13/16	22.515
52 1/4	13	8 1/8	14.890	64 1/2	16	10 3/8	22.695
52 1/2	13	8 7/8	15.033	64 3/4	16	11 3/8	22.867
52 3/4	13	9 11/16	15.176	65	17	3 1/16	23.044
53	13	10 1/2	15.320	65 1/4	17	1 5/16	23.222
53 1/4	13	11 1/4	15.465	65 1/2	17	1 3/4	23.400
53 1/2	14	1 1/16	15.611	65 3/4	17	2 1/2	23.578
53 3/4	14	1 13/16	15.757	66	17	3 5/16	23.758
54	14	1 5/8	15.904	66 1/4	17	4 1/8	23.939
54 1/4	14	2 3/8	16.052	66 1/2	17	4 7/8	24.119
54 1/2	14	3 3/16	16.200	66 3/4	17	5 11/16	24.307
54 3/4	14	4	16.349	67	17	6 7/16	24.484
55	14	4 3/4	16.499	67 1/4	17	7 1/4	24.667
55 1/4	14	5 9/16	16.649	67 1/2	17	8	24.851
55 1/2	14	6 5/16	16.800	67 3/4	17	8 13/16	25.035
55 3/4	14	7 1/8	16.952	68	17	9 5/8	25.220
56	14	7 7/8	17.104	68 1/4	17	10 3/8	25.406
56 1/4	14	8 11/16	17.257	68 1/2	17	11 3/16	25.592
56 1/2	14	9 1/2	17.411	68 3/4	17	11 15/16	25.779
56 3/4	14	10 1/4	17.565	69	18	3 3/4	25.967

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# CIRCUMFERENCE AND AREA OF CIRCLES (Continued)

Diameter In Inches	Circumference		Area Square Feet	Diameter In Inches	Circumference		Area Square Feet
	Feet	Inches			Feet	Inches	
69 1/4	18	1 1/2	26.156	91	23	9 7/8	45.166
69 1/2	18	2 5/16	26.345	91 1/2	23	11 7/16	45.663
69 3/4	18	3 1/8	26.535	92	24	1	46.164
70	18	3 7/8	26.725	92 1/2	24	1 9/16	46.667
70 1/4	18	4 11/16	26.920	93	24	4 1/8	47.173
70 1/2	18	5 7/16	27.110	93 1/2	24	5 11/16	47.681
70 3/4	18	6 1/4	27.301	94	24	7 1/4	48.193
71	18	7	27.494	94 1/2	24	8 7/8	48.707
71 1/4	18	7 13/16	27.690	95	24	10 7/16	49.224
71 1/2	18	8 9/16	27.881	95 1/2	25	...	49.743
71 3/4	18	9 3/8	28.080	96	25	1 9/16	50.265
72	18	10 3/16	28.274	96 1/2	25	3 1/8	50.790
72 1/2	18	11 3/4	28.670	97	25	4 11/16	51.318
73	19	1 5/16	29.065	97 1/2	25	6 1/4	51.849
73 1/2	19	2 7/8	29.465	98	25	7 7/8	52.382
74	19	4 7/16	29.867	98 1/2	25	9 7/16	52.917
74 1/2	19	6	30.272	99	25	11	53.456
75	19	7 9/16	30.680	99 1/2	26	9/16	53.997
75 1/2	19	9 3/16	31.090	100	26	2 1/8	54.542
76	19	10 3/4	31.503	100 1/2	26	3 11/16	55.088
76 1/2	20	5/16	31.920	101	26	5 1/4	55.638
77	20	1 7/8	32.338	101 1/2	26	6 13/16	56.191
77 1/2	20	3 7/16	32.759	102	26	8 7/16	56.745
78	20	5	33.183	102 1/2	26	10	57.303
78 1/2	20	6 9/16	33.610	103	26	11 9/16	57.863
79	20	8 1/8	34.039	103 1/2	27	1 1/8	58.427
79 1/2	20	9 3/4	34.472	104	27	2 11/16	58.992
80	20	11 5/16	34.907	104 1/2	27	4 1/4	59.562
80 1/2	21	7/8	35.344	105	27	5 13/16	60.132
81	21	2 7/16	35.785	105 1/2	27	7 7/16	60.705
81 1/2	21	4	36.228	106	27	9	61.283
82	21	5 9/16	36.674	106 1/2	27	10 9/16	61.861
82 1/2	21	7 1/8	37.122	107	28	1/8	62.446
83	21	8 3/4	37.574	107 1/2	28	1 11/16	63.030
83 1/2	21	10 5/16	38.028	108	28	3 1/4	63.617
84	21	11 7/8	38.485	108 1/2	28	4 13/16	64.208
84 1/2	22	1 7/16	38.944	109	28	6 3/8	64.801
85	22	3	39.406	109 1/2	28	8	65.396
85 1/2	22	4 9/16	39.872	110	28	9 9/16	65.995
86	22	6 1/8	40.339	110 1/2	28	11 1/8	66.596
86 1/2	22	7 11/16	40.809	111	29	1 1/16	67.201
87	22	9 5/16	41.282	111 1/2	29	2 1/4	67.808
87 1/2	22	10 7/8	41.758	112	29	3 13/16	68.417
88	23	7/16	42.237	112 1/2	29	5 3/8	69.030
88 1/2	23	2	42.718	113	29	7	69.644
89	23	3 9/16	43.202	113 1/2	29	8 9/16	70.262
89 1/2	23	5 1/8	43.689	114	29	10 1/8	70.882
90	23	6 11/16	44.177	114 1/2	29	11 11/16	71.506
90 1/2	23	8 5/16	44.671	115	30	1 1/4	72.131

Continued on next page

# DATA

## CIRCUMFERENCE AND AREA OF CIRCLES (Continued)

Diameter In Inches	Circumference		Area Square Feet	Diameter In Inches	Circumference		Area Square Feet
	Feet	Inches			Feet	Inches	
115½	30	2 <sup>13</sup> / <sub>16</sub>	72.759	118	30	10 <sup>11</sup> / <sub>16</sub>	75.944
116	30	4¾	73.391	118½	31	¼	76.589
116½	30	5 <sup>15</sup> / <sub>16</sub>	74.026	119	31	1 <sup>13</sup> / <sub>16</sub>	77.236
117	30	7 <sup>9</sup> / <sub>16</sub>	74.662	119½	31	3¾	77.887
117½	30	9¾	75.301	120	31	4 <sup>15</sup> / <sub>16</sub>	78.540

To find the weight of a circle, multiply its area in square feet by the weight per square foot, as shown on pages 229 to 234. For example, if you want the weight of an ⅛" thick brass circle, 23" in diameter . . .

Multiply 5.508 pounds (weight per sq. ft. of ⅛" brass)  
by 2.885 (area in square feet)  
= 15.891 + pounds

IANA

## MELTING POINTS

### Approximate

Elements	De- grees Cen- ti- grade	De- grees Fahren- heit	Elements	De- grees Cen- ti- grade	De- grees Fahren- heit
ALUMINUM.....	660	1220	MAGNESIUM.....	651	1204
ANTIMONY.....	631	1167	MANGANESE.....	1260	2300
BARIUM.....	850	1562	MERCURY.....	—39	—38
BERYLLIUM.....	1350	2462	MOLYBDENUM... 2620		4748
BISMUTH.....	271	520	NICKEL.....	1446	2635
CADMIUM.....	321	610	PHOSPHOROUS (YELLOW).....	44	111
CALCIUM.....	810	1490	PLATINUM.....	1773	3223
CARBON.....	3500	6332	SILICON.....	1420	2588
CHROMIUM.....	1765	3209	SILVER.....	961	1761
COBALT.....	1480	2696	TIN.....	232	449
COPPER.....	1083	1981	TUNGSTEN.....	3400	6152
GOLD.....	1063	1945	VANADIUM.....	1710	3110
IRON.....	1535	2795	ZINC.....	420	787
LEAD.....	327	621			
LITHIUM.....	186	367			

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OKLAHOMA



## USEFUL INFORMATION

### RELATIVE TO A CIRCLE

To find Circumference — Multiply the diameter by 3.1416; or, divide diameter by 0.3183.  
 To find Diameter — Multiply the circumference by 0.3183; or, divide circumference by 3.1416.  
 To find Radius — Multiply the circumference by 0.15915; or, divide circumference by 6.28318; or, divide diameter by 2.  
 To find the Side of a Square to be inscribed in a Circle — Multiply diameter by 0.7071; or, multiply the circumference by 0.2251; or, divide the circumference by 4.4428.  
 To find the Side of a Square to equal the Area of a Circle — Multiply the diameter by 0.8862; or, divide diameter by 1.1284; or, multiply the circumference by 0.2821; or, divide circumference by 3.545.  
 To find the Area of a Circle — Multiply the circumference by one-quarter of the diameter; or, multiply the square of the diameter by 0.7854; or, multiply the square of the circumference by 0.7958; or, multiply the square of one-half the diameter by 3.1416.  
 Doubling the diameter of a circle increases the area 4 times.

### RELATIVE TO A SQUARE

A side multiplied by 1.412 equals the diameter of a circle which will circumscribe the given square.  
 A side multiplied by 4.443 equals the circumference of its circumscribing circle.  
 A side multiplied by 1.1284 equals the diameter of a circle equal in area to that given square.  
 A side multiplied by 3.545 equals circumference of an equal circle.  
 To find the Area of an Ellipse — Multiply the product of its axes by .7854; or, multiply the product of its semi-axes by 3.14159.

### RELATIVE TO OTHER GEOMETRICAL FORMS

To find:  
 Contents of a cylinder = area of end  $\times$  length.  
 Contents of a wedge = area of triangular base  $\times$  altitude.  
 Surface of a cylinder = length  $\times$  circumference plus area of both ends.  
 Surface of a sphere = diameter squared  $\times$  3.1416; or, diameter  $\times$  circumference.  
 Contents of a sphere = diameter cubed  $\times$  0.5236.  
 Contents of a pyramid or cone, right or oblique, -regular or irregular = area of base  $\times$  one-third of the altitude.  
 Area of a triangle = base  $\times$  one-half the altitude.  
 Area of a parallelogram = base  $\times$  altitude.  
 Area of a trapezoid = altitude  $\times$  one-half the sum of parallel sides.

### TO FIND THE CAPACITY OF A TANK IN GALLONS

1. All measurements must be reduced to inches.  
 For rectangular tanks, multiply the length by the width by the depth.  
 For cylindrical tanks, multiply the length by the square of the diameter by .7854.  
 For elliptical section tanks, multiply the length by the short diameter by the long diameter by .0339.
2. Divide the result of any of the above calculations by 231, which is the number of cubic inches in a gallon; the result is the capacity of the tank in gallons.

# DATA

## CONVERSION OF SFM TO RPM

Diameter in inches	SURFACE FEET PER MINUTE																			
	10	15	20	25	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
1/16	0.625	917	1222	1528	1833	2445	3056	3667	4278	4889	5500	6111	6722	7334	7945	8556	9167	9778	10390	11000
1/8	1.25	306	458	611	764	917	1222	1528	1833	2138	2445	2750	3056	3361	3667	3973	4278	4584	4889	5195
3/16	1.875	204	306	407	509	611	815	1019	1222	1426	1630	1833	2037	2241	2445	2648	2852	3056	3259	3463
1/4	2.5	153	229	306	382	458	611	764	917	1070	1222	1375	1528	1681	1833	1986	2139	2292	2445	2597
5/16	3.125	122	183	244	306	367	489	611	733	856	978	1100	1222	1345	1467	1589	1711	1833	1956	2078
3/8	3.75	102	153	204	255	306	407	509	611	713	815	917	1019	1120	1222	1324	1426	1528	1630	1732
7/16	4.375	87	131	175	218	262	349	437	524	611	698	786	873	960	1046	1133	1222	1310	1397	1484
1/2	5	76	115	153	191	229	306	382	458	535	611	688	764	840	917	993	1070	1146	1222	1299
5/8	5.625	68	102	136	170	204	272	340	407	475	543	611	678	747	815	883	951	1019	1086	1154
3/4	6.25	61	92	122	153	183	244	306	367	428	489	550	611	672	733	794	856	917	978	1039
7/8	6.875	56	83	111	139	167	222	278	333	389	444	500	556	611	667	722	778	833	889	945
1	7.5	51	76	102	127	153	203	255	306	357	407	458	509	560	611	662	713	764	815	866
1 1/16	8.125	47	71	94	118	141	188	235	282	329	376	423	470	517	564	611	658	705	752	799
1 1/8	8.75	44	65	87	109	131	175	218	262	306	349	393	436	480	524	567	611	655	698	742
1 3/8	9.375	41	61	81	102	122	163	204	245	285	326	367	407	448	489	530	570	611	652	693
1 1/2	10	38	57	76	96	115	153	191	229	267	306	344	382	420	458	497	535	573	611	649
1 5/8	10.625	34	51	68	85	102	136	170	204	238	272	306	340	373	407	441	475	509	543	577
1 3/4	11.25	31	46	61	76	92	122	153	183	214	244	275	308	336	367	397	428	458	489	519
1 7/8	11.875	28	42	56	69	83	111	139	167	194	222	250	278	306	333	361	389	417	444	472
2	12.5	25	38	51	64	76	102	127	153	178	204	229	255	280	306	331	357	382	407	433
2 1/16	13.125	24	35	47	59	70	94	117	141	165	188	212	235	259	282	306	329	353	376	400
2 1/8	13.75	22	33	44	55	65	87	109	131	153	175	196	218	240	262	284	306	327	349	371
2 3/8	14.375	20	31	41	51	61	81	101	122	143	163	183	204	224	244	265	285	306	326	346
2 1/2	15	19	29	38	48	57	76	95	115	134	153	172	191	210	229	248	267	287	306	325
2 5/8	15.625	17	25	34	42	51	68	85	102	119	136	153	170	187	204	221	238	255	272	289
2 3/4	16.25	15	23	31	38	46	61	76	92	107	122	137	153	168	183	199	214	229	244	260
2 7/8	16.875	14	21	28	35	42	56	69	83	97	111	125	139	153	167	181	194	208	222	236
3	17.5	13	19	25	32	38	51	64	76	89	102	115	127	140	153	166	178	191	204	216
3 1/16	18.125																			
3 1/8	18.75																			
3 3/8	19.375																			
3 1/2	20																			
3 5/8	20.625																			
3 3/4	21.25																			
3 7/8	21.875																			
4	22.5																			

ANA

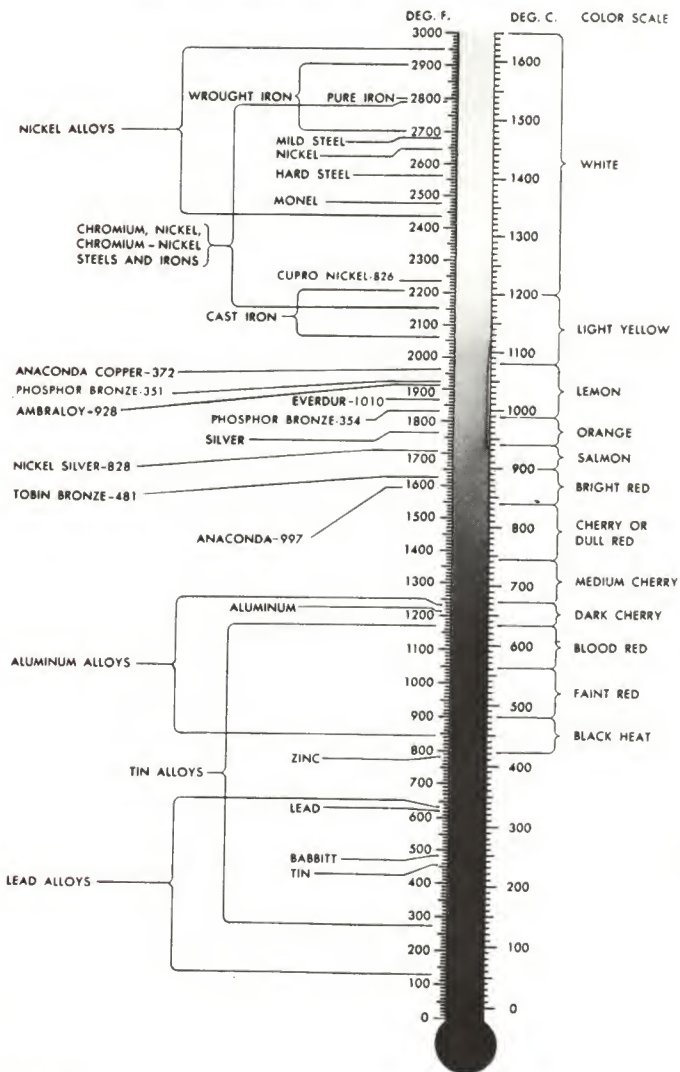
TEMPERATURE  
CONVERSION FORMULAS

$$F = (C \times 1.8) + 32$$

$$C = \frac{(F - 32)}{1.8}$$

F = Temperature in Fahrenheit Degrees.

C = Temperature in Centigrade Degrees.

CONVERSION TABLE, MELTING POINTS AND TEMPERATURE  
COLORS OF COMMONLY USED METALS AND ALLOYS



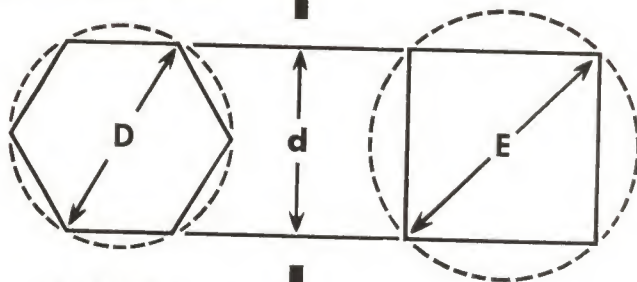
## COMPARATIVE PHYSICAL PROPERTIES OF METALS

Density	Melting Point Degrees C	Melting Point Degrees F	Specific Heat	Heat Expansion Per °C	Heat Cond'y % of Cu	Elec. Cond'y % of Cu	Coeff. of Elec. Res. Per °C	Modulus of Elasticity psi
1100 Aluminum.....	660	1220	0.218	.000024	52.	56.59	.0042	10,000,000
2017 Aluminum.....	600	1110	.....	.000022	40.	32.	.....	10,000,000
Copper.....	1083	1981	0.093	.000017	100.	100.	.0040	16,000,000
Brass.....	900	1650	0.088	.000020	28.	28.	.0015	13,800,000
Phosphor Bronze.....	*	.....	0.104	.000018	.....	36.	.0039	16,000,000
Everdur.....	1050	1920	.....	.000017	30.	6.	.....	15,000,000
Nickel Silver.....	*	.....	0.095	.000018	7.6	5.2	.0003	17,000,000
Monel.....	1300-1350	2370-2460	0.127	.000014	6.6	4.	.0019	26,000,000
Nickel.....	1446	2635	0.130	.000013	15.5	16.	.0041	30,000,000
Inconel.....	1370	2500	.....	.000013	3.5	.....	.....	31,000,000
18/8 Cr/Ni Steel.....	1400	2550	0.118	.000017	3.6	2.8	.....	28,600,000
17% Cr Iron.....	1400	2550	.....	.000010	5.	.....	.0015	.....
14% Cr Iron.....	1490	2715	.....	.000011	5.	2.8	.....	30,000,000
Zinc.....	420	787	0.094	.000029	29.	28.2	.0040	13,700,000
Lead.....	327	621	0.031	.000029	9.	7.8	.0041	800,000
Iron.....	1535	2795	0.110	.000013	15.	15.	.0062	25,000,000
Steel.....	1400	2550	.....	.000013	6-12	3-15	.....	30,000,000
Cast Iron.....	1000-1200	1830-2190	.....	.000010	10-12	2-12	.....	12-27,000,000
Duriron.....	1260	2300	.....	.000028	17.4	2.5	.....	.....
Silver.....	961	1761	0.056	.000019	110.	106.	.0040	9,000,000
Platinum.....	1755	3190	0.032	.000008	18.	15.	.0036	23,000,000

\*Varies according to grade — consult us.  
These figures should not be used for specification purposes because they are subject to manufacturing limitations which may alter the values.

# **SIZES OF ROUNDS REQUIRED TO MAKE HEXAGONS OR SQUARES**

Distance Across Corners of  
Hexagons and Squares



D x 1.1547 d			E x 1.4142 d		
d	D	E	d	D	E
1/4	0.2886	0.3535	1 3/4	2.0207	2.4708
9/32	0.3247	0.3977	1 5/32	2.0568	2.5190
5/16	0.3608	0.4419	1 13/16	2.0929	2.5632
11/32	0.3968	0.4861	1 27/32	2.1289	2.6074
3/8	0.4329	0.5303	1 7/8	2.1650	2.6516
13/32	0.4690	0.5745	1 29/32	2.2011	2.6958
7/16	0.5051	0.6187	1 15/16	2.2372	2.7400
15/32	0.5412	0.6629	1 31/32	2.2733	2.7842
1/2	0.5773	0.7071	2	2.3094	2.8284
17/32	0.6133	0.7513	2 1/32	2.3455	2.8726
9/16	0.6494	0.7955	2 1/16	2.3815	2.9168
19/32	0.6855	0.8397	2 3/32	2.4176	2.9610
5/8	0.7216	0.8839	2 1/8	2.4537	3.0052
21/32	0.7576	0.9281	2 5/32	2.4898	3.0494
11/16	0.7937	0.9723	2 3/16	2.5259	3.0936
23/32	0.8298	1.0164	2 1/4	2.5981	3.1820
3/4	0.8659	1.0606	2 5/16	2.6702	3.2703
25/32	0.9020	1.1048	2 3/8	2.7424	3.3587
13/16	0.9380	1.1490	2 7/16	2.8145	3.4471
27/32	0.9741	1.1932	2 1/2	2.8867	3.5355
7/8	1.0102	1.2374	2 9/16	2.9583	3.6239
29/32	1.0463	1.2816	2 5/8	3.0311	3.7123
15/16	1.0824	1.3258	2 11/16	3.1032	3.8007
31/32	1.1184	1.3700	2 3/4	3.1754	3.8891
1	1.1547	1.4142	2 13/16	3.2476	3.9794
1 1/32	1.1907	1.4584	2 7/8	3.3197	4.0658
1 1/16	1.2268	1.5026	2 15/16	3.3919	4.1542
1 3/32	1.2629	1.5468	3	3.4641	4.2426
1 1/8	1.2990	1.5910	3 1/16	3.5362	4.3310
1 5/32	1.3351	1.6352	3 1/8	3.6084	4.4194
1 3/16	1.3712	1.6793	3 3/16	3.6806	4.5078
1 7/32	1.4073	1.7235	3 1/4	3.7527	4.5962
1 1/4	1.4434	1.7677	3 5/16	3.8249	4.6846
1 9/32	1.4794	1.8119	3 3/8	3.8971	4.7729
1 5/16	1.5155	1.8561	3 7/16	3.9692	4.8613
1 11/32	1.5516	1.9003	3 1/2	4.0414	4.9497
1 3/8	1.5877	1.9445	3 9/16	4.1136	5.0381
1 13/32	1.6238	1.9887	3 5/8	4.1857	5.1265
1 7/16	1.6598	2.0329	3 11/16	4.2579	5.2149
1 15/32	1.6959	2.0771	3 3/4	4.3301	5.3033
1 1/2	1.7320	2.1213	3 13/16	4.4023	5.3917
1 17/32	1.7681	2.1655	3 7/8	4.4744	5.4801
1 9/16	1.8042	2.2097	3 15/16	4.5466	5.5684
1 19/32	1.8403	2.2539	4	4.6188	5.6568
1 5/8	1.8764	2.2981	4 1/8	4.7631	5.8336
1 21/32	1.9124	2.3423	4 1/4	4.9074	6.0104
1 11/16	1.9485	2.3865	4 3/8	5.0518	6.1872
1 23/32	1.9846	2.4306	4 1/2	5.1961	6.3639

# DATA

## MISCELLANEOUS CONVERSION FACTORS

Metric and English

To Change From	To	Multiply By
FEET	METERS	0.3048
MILES	KILOMETERS	1.60935
METERS	INCHES	39.37
METERS	FEET	3.28083
KILOMETERS	MILES	0.62137
SQUARE FEET	SQUARE METERS	0.0929
SQUARE YARDS	SQUARE METERS	0.8361
SQUARE METERS	SQUARE YARDS	1.196
CUBIC YARDS	CUBIC METERS	0.7646
CUBIC METERS	CUBIC YARDS	1.308
FLUID OUNCES	CUBIC CENTIMETERS	29.574
QUARTS	LITERS	0.9464
CUBIC CENTIMETERS	FLUID OUNCES	0.0344
LITERS	QUARTS	1.0567
GRAINS	MILLIGRAMS	64.7989
POUNDS (AVOIRDUPOIS)	KILOGRAMS	0.4536
OUNCES (APOTHECARY)	GRAMS	31.1035
POUNDS (APOTHECARY)	KILOGRAMS	0.3732
GRAMS	GRAINS	15.4324
KILOGRAMS	POUNDS	2.2046
KILOWATTS	HORSE POWER	1.34
HORSE POWER	KILOWATTS	0.746
B. T. U.	CALORIES	252.0
CALORIES	B. T. U.	.003968
POUNDS	GRAMS	453.6
OUNCES (AV.)	GRAMS	28.35
INCHES	CENTIMETERS	2.54
INCHES	DECIMETERS	0.254
FEET	CENTIMETERS	30.48
FEET	DECIMETERS	3.048
SQUARE INCHES	SQUARE CENTIMETERS	6.452
SQUARE INCHES	SQUARE DECIMETERS	0.0645
SQUARE FEET	SQUARE CENTIMETERS	929.0
SQUARE FEET	SQUARE DECIMETERS	9.29
CUBIC INCHES	CUBIC CENTIMETERS	16.387
OUNCES PER SQ. FOOT	MILLIG. PER SQ. DECIMETER	3050.
GRAMS PER SQ. IN.	MILLIG. PER SQ. DECIMETER PER DAY	360000.0
PER HR.	MILLIG. PER SQ. DECIMETER PER DAY	133.8
POUNDS PER SQ. FT.	POUNDS	0.002205
PER YR.	OUNCES (AV.)	0.03527
GRAMS	INCHES	0.3937
GRAMS	INCHES	3.937
CENTIMETERS	FEET	0.03281
DECIMETERS	FEET	0.3281
CENTIMETERS	SQUARE INCHES	0.1550
DECIMETERS	SQUARE INCHES	15.50
SQUARE CENTIMETERS	SQUARE FEET	0.001076
SQUARE DECIMETERS	SQUARE FEET	0.1076
SQUARE CENTIMETERS	CUBIC INCHES	0.06102
SQUARE DECIMETERS	CUBIC INCHES	0.06102



# DATA

## WEIGHTS AND MEASURES

Metric and English

### LENGTH

1 MIL	=	.001	INCH
	=	.025400	MILLIMETER
	=	.0025400	CENTIMETER
1 INCH	=	1000	MILS
	=	25.400	MILLIMETERS
	=	2.5400	CENTIMETERS
1 FOOT	=	30.480	CENTIMETERS
	=	.30480	METERS
1 YARD	=	91.440	CENTIMETERS
	=	.9144	METER
1 MILE	=	1609.4	METERS
	=	1.6094	KILOMETERS
1 MILLIMETER	=	39.370	MILS
	=	.039370	INCH
1 CENTIMETER	=	.39370	INCH
	=	.032808	FOOT
1 METER	=	39.370	INCHES
	=	3.2808	FEET
1 KILOMETER	=	3280.8	FEET
	=	.62137	MILE

### SURFACE

1 CIRC. MIL	=	.78540	SQ. MIL
	=	.000001	CIRC. INCH
	=	.00064516	CIRC. MILLIMETER
1 SQ. MIL	=	1.2732	CIRC. MILS
	=	.000001	SQ. INCH
	=	.00064516	SQ. MILLIMETER
1 CIRC. INCH	=	1000000	CIRC. MILS
	=	645.16	CIRC. MILLIMETERS
	=	6.4516	CIRC. CENTIMETERS
1 SQUARE INCH	=	1000000	SQ. MILS
	=	1273240	CIRC. MILS
	=	645.16	SQ. MILLIMETERS
	=	6.4516	SQ. CENTIMETERS
1 SQUARE FOOT	=	929.03	SQ. CENTIMETERS
1 CIRC. MILLIMETER	=	1550.0	CIRC. MILS

### VOLUME

1 CUBIC INCH	=	16.387	CUBIC CENTIMETERS
1 CUBIC FOOT	=	28317	CUBIC CENTIMETERS
1 CUBIC CENTIMETER	=	.061023	CUBIC INCH
1 CUBIC INCH OF WATER	=	.0361	POUNDS
1 CUBIC FOOT OF WATER	=	62.5	POUNDS

### WEIGHT

1 POUND (AVOIR)	=	453.59	GRAMS
1 GRAM	=	.0022046	POUND (AVOIR.)
1 KILOGRAM	=	2.2046	POUNDS (AVOIR.)

# DATA

## CONVERTING INCHES AND FRACTIONS OF AN INCH INTO DECIMALS OF A FOOT

	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	
.....	.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167	.....
$\frac{1}{16}$	.0052	.1719	.2552	.3385	.4219	.5052	.5885	.6719	.7552	.8385	.9219	$\frac{1}{16}$
$\frac{1}{8}$	.0104	.1771	.2604	.3438	.4271	.5104	.5938	.6771	.7604	.8438	.9271	$\frac{1}{8}$
$\frac{3}{16}$	.0156	.1823	.2656	.3490	.4323	.5156	.5990	.6823	.7656	.8490	.9323	$\frac{3}{16}$
$\frac{1}{4}$	.0208	.1875	.2708	.3542	.4375	.5208	.6042	.6875	.7708	.8542	.9375	$\frac{1}{4}$
$\frac{5}{16}$	.0260	.1927	.2760	.3594	.4427	.5260	.6094	.6927	.7760	.8594	.9427	$\frac{5}{16}$
$\frac{3}{8}$	.0313	.1979	.2813	.3646	.4479	.5313	.6146	.6979	.7813	.8646	.9479	$\frac{3}{8}$
$\frac{7}{16}$	.0365	.2031	.2865	.3698	.4531	.5365	.6198	.7031	.7865	.8698	.9531	$\frac{7}{16}$
$\frac{1}{2}$	.0417	.2083	.2917	.3750	.4583	.5417	.6250	.7083	.7917	.8750	.9583	$\frac{1}{2}$
$\frac{9}{16}$	.0469	.2135	.2969	.3802	.4635	.5469	.6302	.7135	.7969	.8802	.9635	$\frac{9}{16}$
$\frac{5}{8}$	.0521	.2188	.3021	.3854	.4688	.5521	.6354	.7188	.8021	.8854	.9688	$\frac{5}{8}$
$\frac{11}{16}$	.0573	.2240	.3073	.3906	.4740	.5573	.6406	.7240	.8073	.8906	.9740	$\frac{11}{16}$
$\frac{3}{4}$	.0625	.2294	.3125	.3958	.4792	.5625	.6458	.7292	.8125	.8958	.9792	$\frac{3}{4}$
$\frac{13}{16}$	.0677	.2344	.3177	.4010	.4844	.5677	.6510	.7344	.8177	.9010	.9844	$\frac{13}{16}$
$\frac{7}{8}$	.0729	.2396	.3229	.4063	.4896	.5729	.6563	.7396	.8229	.9063	.9896	$\frac{7}{8}$
$\frac{15}{16}$	.0781	.2448	.3281	.4115	.4948	.5781	.6615	.7448	.8281	.9115	.9948	$\frac{15}{16}$

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# DATA

## COMPARISON OF GAUGES

When Ordering Specify Thickness by Decimal Part of an Inch as Well as Name and Number of Gauge

Gauge No.	American or Brown & Sharpe	Birmingham or Stubs	Washburn & Moen	United States Standard (Revised)	United States Standard	Imperial S. W. G.
7/0			.490		.500	.500
6/0	.5800		.460		.46875	.464
5/0	.5165		.430		.4375	.432
4/0	.4600	.454	.3938	.4063	.40625	.400
3/0	.4096	.425	.3625	.375	.375	.372
2/0	.3648	.380	.3310	.3438	.34375	.348
1/0	.3249	.340	.3065	.3125	.3125	.324
1	.2893	.300	.2830	.2813	.28125	.300
2	.2576	.284	.2625	.2656	.265625	.276
3	.2294	.259	.2437	.2391	.25	.252
4	.2043	.238	.2253	.2242	.234375	.232
5	.1819	.220	.2070	.2092	.21875	.212
6	.1620	.203	.1920	.1943	.203125	.192
7	.1443	.180	.1770	.1793	.1875	.176
8	.1285	.165	.1620	.1644	.171875	.160
9	.1144	.148	.1483	.1495	.15625	.144
10	.1019	.134	.1350	.1345	.140625	.128
11	.09074	.120	.1205	.1196	.125	.116
12	.08081	.109	.1055	.1046	.109375	.104
13	.07196	.095	.0915	.0897	.09375	.092
14	.06408	.083	.0800	.0747	.078125	.080
15	.05707	.072	.0720	.0673	.0703125	.072
16	.05082	.065	.0625	.0598	.0625	.064
17	.04526	.058	.0540	.0538	.05625	.056
18	.04030	.049	.0475	.0478	.05	.048
19	.03589	.042	.0410	.0418	.04375	.040
20	.03196	.035	.0348	.0359	.0375	.036
21	.02846	.032	.03175	.0329	.034375	.032
22	.02535	.028	.0286	.0299	.03125	.028
23	.02257	.025	.0258	.0269	.028125	.024
24	.02010	.022	.0230	.0239	.025	.022
25	.01790	.020	.0204	.0209	.021875	.020
26	.01594	.018	.0181	.0179	.01875	.018
27	.01420	.016	.0173	.0164	.0171875	.0164
28	.01264	.014	.0162	.0149	.015625	.0148
29	.01126	.013	.0150	.0135	.0140625	.0136
30	.01003	.012	.0140	.0120	.0125	.0124
31	.008928	.010	.0132	.0109	.0109375	.0116
32	.007950	.009	.0128	.0102	.01015625	.0108
33	.007080	.008	.0118	.0094	.009375	.0100
34	.006305	.007	.0104	.0086	.00859375	.0092
35	.005615	.005	.0095	.0078	.0078125	.0084
36	.00500	.004	.0090	.0070	.00703125	.0076
37	.004453		.0085		.006640625	.0068
38	.003965		.008		.00625	.0060
39	.003531		.0075			.0052
40	.003145		.007			.0048



# DATA

## DECIMAL AND MILLIMETER EQUIVALENTS OF INCH FRACTIONS

Fraction	Decimal	Millimeter	Fraction	Decimal	Millimeter
$\frac{1}{64}$	.0156	0.397	$\frac{33}{64}$	.5156	13.097
$\frac{1}{32}$	.0312	0.794	$\frac{17}{32}$	.5312	13.494
$\frac{3}{64}$	.0468	1.191	$\frac{35}{64}$	.5468	13.891
$\frac{1}{16}$	.0625	1.588	$\frac{9}{16}$	.5625	14.288
$\frac{5}{64}$	.0781	1.984	$\frac{37}{64}$	.5781	14.684
$\frac{3}{32}$	.0937	2.381	$\frac{19}{32}$	.5937	15.081
$\frac{7}{64}$	.1093	2.778	$\frac{39}{64}$	.6093	15.478
$\frac{1}{8}$	.1250	3.175	$\frac{5}{8}$	.6250	15.875
$\frac{9}{64}$	.1406	3.572	$\frac{41}{64}$	.6406	16.272
$\frac{5}{32}$	.1562	3.969	$\frac{21}{32}$	.6562	16.669
$\frac{11}{64}$	.1718	4.366	$\frac{43}{64}$	.6718	17.066
$\frac{3}{16}$	.1875	4.763	$\frac{11}{16}$	.6875	17.463
$\frac{13}{64}$	.2031	5.159	$\frac{45}{64}$	.7031	17.859
$\frac{7}{32}$	.2187	5.556	$\frac{23}{32}$	.7187	18.256
$\frac{15}{64}$	.2343	5.953	$\frac{47}{64}$	.7343	18.653
$\frac{1}{4}$	.2500	6.350	$\frac{3}{4}$	.7500	19.050
$\frac{17}{64}$	.2656	6.747	$\frac{49}{64}$	.7656	19.447
$\frac{9}{32}$	.2812	7.144	$\frac{25}{32}$	.7812	19.844
$\frac{19}{64}$	.2968	7.541	$\frac{51}{64}$	.7968	20.241
$\frac{5}{16}$	.3125	7.938	$\frac{13}{16}$	.8125	20.638
$\frac{21}{64}$	.3281	8.334	$\frac{53}{64}$	.8281	21.034
$\frac{11}{32}$	.3437	8.731	$\frac{27}{32}$	.8437	21.431
$\frac{23}{64}$	.3593	9.128	$\frac{55}{64}$	.8593	21.828
$\frac{3}{8}$	.3750	9.525	$\frac{7}{8}$	.8750	22.225
$\frac{25}{64}$	.3906	9.922	$\frac{57}{64}$	.8906	22.622
$\frac{13}{32}$	.4062	10.319	$\frac{29}{32}$	.9062	23.019
$\frac{27}{64}$	.4218	10.716	$\frac{59}{64}$	.9218	23.416
$\frac{7}{16}$	.4375	11.113	$\frac{15}{16}$	.9375	23.813
$\frac{29}{64}$	.4531	11.509	$\frac{61}{64}$	.9531	24.209
$\frac{15}{32}$	.4687	11.906	$\frac{31}{32}$	.9687	24.606
$\frac{31}{64}$	.4843	12.303	$\frac{63}{64}$	.9843	25.003
$\frac{1}{2}$	.5000	12.700	1	1.0000	25.400

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